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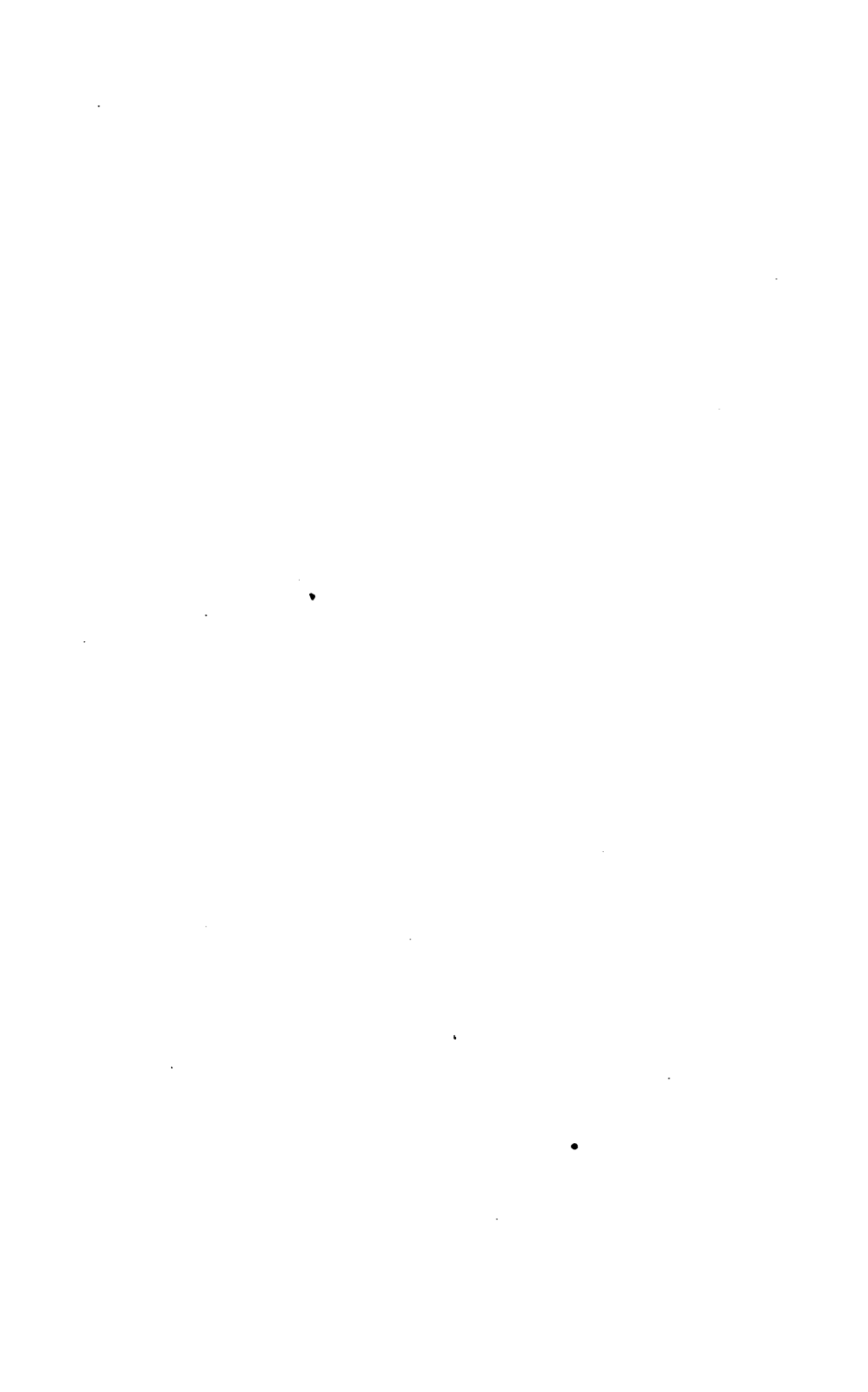
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HENRY C. LEA—Philadelphia.

T. A. McBride
A

GUIDE TO THERAPEUTICS AND MATERIA MEDICA.

BY

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ENLARGED AND ADAPTED TO THE U. S. PHARMACOPŒIA

BY

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PHILADELPHIA:
HENRY C. LEA.
1877.

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EDITOR'S PREFACE.

THERE is no more encouraging evidence of progress in medical science than the growing desire of the profession for exact information concerning the action of remedial agents. A tendency towards empiricism, springing from too exclusive a reliance upon clinical teachings, finds its natural correction in increased familiarity with ascertained facts respecting the influence of drugs upon the human system in health and disease; and no argument is needed to show that if therapeutics is ever to attain the precision of a science, it must be based upon the fullest attainable knowledge of this kind.

The present volume, though small in bulk, is an intelligent effort in this direction, containing, as it does, in moderate compass, such well-digested facts concerning the physiological and therapeutical action of remedies as are reasonably established up to the present time. By a convenient arrangement the corresponding effects in health and disease of each article are presented in parallel columns, not only rendering reference easier, but also impressing the facts more strongly upon the mind of the reader.

In reproducing the "GUIDE TO THERAPEUTICS," very considerable additions have been found desirable to adapt it thoroughly to the wants of the American student—additions which have seemed to warrant the insertion of the words "Materia Medica" in the title-page. Without altering the peculiar features of the original, some changes have been made in the arrangement, and very copious notes have been introduced, embodying the latest revision of the U. S. Pharmacopœia, together with the antidotes to the more prominent poisons, and such of the newer remedial agents as seemed necessary to the completeness of the whole. All matter thus added will be found distinguished from the text by brackets [].

It is hoped that the volume in its present shape will prove to be well suited to the wants of the student and junior practitioner, from its compendious form, and the clearness with which the leading facts of therapeutics and the materia medica are set forth.

PHILADELPHIA, November, 1877.

PREFACE.

IN these days of profuse publication, a preface coming from any one who ventures to write a text-book must assume, in great measure, an apologetic tone. Elaborate and comprehensive works on Therapeutics now crowd our shelves, and the question may not unnaturally arise, what excuse can be given for adding another item to the rapidly increasing list? In reply to this I can only express a hope that room may be found for a smaller handbook than those more elaborate treatises which reflect so faithfully the progress of modern science, and that my little bark may float peacefully by the side of more richly laden vessels without being entirely submerged by their waves. I cannot, of course, expect either to supersede or to rival the classical manuals of Ringer, Wood, and others, and all I aim at is to present the subject in briefer compass, in perhaps more systematic form, and unencumbered by any botanical or pharmaceutical detail.

Space has not enabled me to acknowledge the sources from which I have been enabled to compile the follow-

ing pages ; and I can only express in general terms my grateful sense of the labors of many able and industrious workers in the field of Therapeutics. I have freely drawn much valuable material from the systematic works of Stillé, Neligan, Garrod, Ringer, Wood, Bartholow, Phillips, Thorowgood, Nothnagel, Royle, and Christison ; and I have also derived important instruction from the writings of Brunton, Handfield Jones, Fraser, Fothergill, John Harley, Anstie, Broadbent, Liebreich, and many others who have contributed important aid to the progress of our subject in later years.

For many of my prescriptions I am more especially indebted to Bartholow, and to the very handy little "Lessons on Prescribing" by Dr. Hansell Griffiths.

23 BROOK STREET, GROSVENOR SQUARE, W.

April, 1877.

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A GUIDE TO THERAPEUTICS.

INTRODUCTION.

PREVIOUS to the study of the individual articles comprised within our national Pharmacopœia, the temptation is very strong to launch forth into a disquisition on the general principles of therapeutics. So many interesting physiological considerations are involved in the actions and uses of drugs, and so many important illustrations might readily be drawn from the wide field of practical medicine, that little apology would really be needed for consuming some of our space in this way. Therapeutics has lately shown a systematic vitality which amply redeems its credit from the old-fashioned accusation of want of progress, and perhaps in no other department of our profession have more solid and satisfactory advances been made. But this very condition of vigor renders far more laborious and responsible the task of attempting to reduce to anything like precision the laws on which we are henceforth to prescribe our drugs, or to draw complete generalisations from the enormous mass of complicated material now at our disposal. Progress may occasionally cause temporary confusion by disturbing old beliefs, and furnishing vast legions of sometimes unconfirmed and possibly ill-digested facts; and our present subject is by no means exempt from this almost inevitable tendency of true science.

A careful study of the many exhaustive works on therapeutics published within the last twenty years brings before us a strange medley of experimental evidence, confusing and contradictory it may be at times, but giving most en-

couraging proofs of the large amount of honest and persevering work now being devoted to the elucidation of this the most important department of the materia medica. In the following pages we must necessarily assume a dogmatic attitude, and if the extreme precision with which our plan compels us to lay down the actions of drugs offends many whose faith is undeveloped or wavering, we can only excuse ourselves by a conscientious desire to contribute something towards a more scientific scheme of arrangement. Although the time has not yet fully come for a complete explanation of all the therapeutical effects of medicinal agents by their proved physiological properties, I have ventured to take a step in this direction, and must only hope that my very defects and failures may be of use in helping others to develop my principles with greater success.

I shall give no systematic sketch of the different ways in which drugs enter the system, as they will be sufficiently indicated in the pages which follow, and as the student will derive much greater benefit by drawing up a scheme of the kind for himself than by lazily running his eye over the cut-and-dried conclusions of a text-book. I am anxious, if possible, to relieve my little work from the accusation of being a mere grinding manual; for although I am not without hope that the systematic arrangement adopted may be of some service for examination purposes by putting the student's ideas and recollections in orderly form, I should also venture to anticipate that practitioners may also be able to turn to its pages for suggestion and instruction. Although I have not, as a rule, given the doses of every drug and every preparation, I have in most cases finished my account of each by a prescription, which will not only embody the average quantity usually employed, but will also indicate the best and most palatable way of combining the special remedial agent.

Another feature of some importance I should consider the series of questions with which my work concludes, and which aim at being in the light of 'puzzles' as Mrs. Faucett expresses it in her admirable little manual of 'Political Economy,' or of suggestive teachings on the border-land between therapeutics and medicine, than as the sort of somewhat sapless query and reply affected by educational treatises.

GENERAL RULES FOR PRESCRIBING.

Preliminary Considerations.—It will be well, before proceeding further, that I should lay down some broad rules which may guide us in the construction of prescriptions; and it seems best to introduce this subject here, instead of placing it, according to more usual custom, at the end of the book, as it is to be our aim and object to devote much care and attention throughout to the best modes of ordering drugs. Much professional credit may be derived from a good prescription, and as much damage done to the practitioner who orders for his patients mixtures which are neither agreeable to the eye nor palatable to the taste. It is well worthy of the student's attention to consider the most pleasant, effectual, and convenient way of ordering the drugs which are required by the sick, and at first he will no doubt consider this a very difficult task. This will partly depend on the fact that he has had the subject of doses and therapeutical actions presented to him in such concentrated form that he will find some awkwardness in using practically the theoretical knowledge which he has presumably obtained. The time at his teacher's disposal is so short that he has to run hurriedly from one drug to another, and bring into immediate relation remedies which differ so widely in their effects as to excite some not unnatural confusion in the minds of his hearers. It is therefore not an uncommon thing to hear students say that they do not think they will ever be able to remember the doses of the principal medicines. Then we must remember that, during attendance on out-patient practice, prescribing is either done on very routine principles, or considerations of time and convenience render it advisable to order most drugs according to registered formulæ, which are merely referred to on the patient's letter by name. Thus, although the student may know that dyspepsia may be treated by *mist. alk. amara*, or debility by *mist. quiniæ*, he would perhaps experience some difficulty in writing a prescription suitable for either case. In the wards, of course, he sees much more prescribing, but is perhaps not often called upon to do it for himself, so that, when he settles down on his own account, it will be some time before he can handle medicines with that ease, confidence, and certainty, which can alone conduce to the comfort of his patients and his

own ultimate success. Now it cannot be out of place to urge upon him here the great importance of frequently exercising himself in this art. Let him put problems to himself, let him run his eye through his text-books, and endeavor to order the various drugs in varied combination ; when he meets with the recommendation to treat a certain disease in a certain way, let him there and then expand these more or less vague directions into the form of a prescription ; and so at last due blending of ingredients, with the avoidance of incompatibles and the concealment of nauseous properties, will come to him with perfect ease and efficiency.

1. Combination of Drugs.—The first thing to be considered in writing a prescription is the object for which we order this certain combination of drugs, which symptoms in our patient's case do we wish to alter or modify, what is to be our principal ingredient, and in what quantity. This being duly settled in our minds, we reflect whether it is better to give this particular article by itself, or to combine it with other substances, which may possibly assist or mitigate its action, or may at all events conceal its more or less nauseous taste. Now it is a very commonly given recommendation that in our prescriptions we should aim at simplicity as much as possible, and this certainly holds good within certain limits. The old-fashioned custom used to be to string together a long list of ill-understood substances in the hope that some one or other of them might hit the right nail on the head, and even now traces of this polypharmacy linger about medical practice. When, however, we are tolerably certain of the action of our drug, and more especially when we are making scientific observations on its mode of action, it is often of great importance that we should not obscure its effects by the addition of any other active substances, but order it either simply in distilled water, or merely combined with other ingredients for flavoring purposes. But we must remember not to carry this principle too far. No fact is more thoroughly proved in therapeutics than the value, under certain conditions, of due combination, and the way in which one drug may assist the action of another.

Thus, taking the case of diuretics, we know well that a prescription containing three or four members of this group will often act where one produces little or no effect, and

that mercury is of undoubted service in assisting the influence of squill and digitalis over the urinary secretion. Cough medicines are always best given in combination with a variety of drugs, and the same holds good of purgatives; for we all know how hyoscyamus or belladonna will both aid and hold in check the action of colocynth, how a little sulphuric acid and iron will promote that of sulphate of magnesia, how jalap aids the peristaltic intestinal contraction to remove the watery fluid which cream of tar tar drains into the bowels.

Several alkaline medicines given together seem to act better in rheumatic fever than the simple administration of one member of the group. Tonics, such as quinine and iron, are blended with advantage. Then again, we add one drug to another for the purpose of counteracting some unpleasant physiological effect; thus spiritus ammonii aromat. mitigates the unpleasant symptom of iodism, and atropia lessens the chances of discomfort which attend the subcutaneous injection of morphia. Instances like this might be multiplied almost *ad infinitum*; but we shall develop the subject further as we go on, and refer frequently to the laws which should guide us in considering whether the various drugs are best ordered singly or in combination.¹

2. Form of Administration.—We must take into consideration whether we ought to administer our drug in a concentrated or diluted form, and here again we shall find it necessary to act very differently under different circumstances. As a general rule, we may lay down that the metals are best given either in pill or in a small quantity of fluid, and this remark applies more especially to those which have very active physiological properties. Thus we generally give arsenic and perchloride of mercury [corrosive sublimate] in a state of only moderate dilution. Salts, on the other hand, and more especially the purgative salts, act best when taken in large quantities of fluid, and we

¹ As well-known examples of this rule we have to remind our readers of the composition of the ext. coloc. co. and pil. coloc. co. [Ph. B.], both of which contain aloes and scammony in addition to the ingredient which gives its name to the mass—the idea being, no doubt, to secure the combined and harmonious action of several purgatives acting on different tracts of intestine; this harmony, so to speak, being aided, and gripping obviated, by the addition of aromatics, such as cardamoms and cloves respectively.

shall find in practice that iodide of potassium is decidedly more efficacious when freely diluted, that sulphate of magnesia follows the same rule, and that in the case of diuretics also we may aid their action by combining the directly flooding or mechanically sluicing effect on the kidney, of large quantities of watery fluid.

3. Proper Time for Exhibition.—The period of administration is also well deserving of careful study, and we may indicate one or two useful rules with regard to the action of alkalies and acids. As acids check acid secretions, and alkalies have a similar influence over those with alkaline reaction and *vice versa*, we can readily understand the effect which they may exercise over digestion. Thus an acid given directly before a meal must interfere with the due assimilation of the nitrogenous articles of diet by checking the supplies of gastric juice, whereas an alkali given at the same time must theoretically produce the best results by stimulating that secretion. If, on the other hand, we give an alkaline medicine after food, we do harm by directly neutralizing the acid on which some part at least of the active principles of the gastric juice depends.¹

Drugs which have a distinctly lowering or irritating effect on the system are best given with or after meals, so as to prevent these results as far as possible; thus we always give arsenic or corrosive sublimate at these times, and find that they are well borne by persons who could not take them on an empty stomach. For a different reason, again, we generally find it convenient to prescribe cod-liver oil after food, not only because it is less likely to cause sickness when given in that way, but because oily matters being absorbed by the lacteals are most readily taken up when these structures are in full working order.

Again, when we wish to imitate or excite a normal phy-

[¹ An important point for the student to learn at the outset is, that nothing can be more fallacious than *a priori* reasoning concerning the therapeutical effects of remedies. Cases of atonic dyspepsia with acidity of the stomach are frequently benefited by dilute mineral acids; and a combination of muriatic acid (gtt. iij.) with pepsin (gr. x.) in water (℥ss) given directly before meals, is constantly prescribed with good results for patients with impaired or weak digestion. Indigestion with pyrosis, or flatulence, may be relieved by alkalies after meals, as in the pleasant preparation known as soda mint (see *Sodii bicarb.*), to which may be conveniently added tincture of nux vomica, or syrup of rhubarb, according to the judgment of the prescriber.]

siological action, we must time our drug accordingly. Opium or any other narcotic is much more likely to produce sleep when taken at night than at other times, and a mild purgative in the morning will often stimulate the peristaltic movement of the intestines to evacuate the bowels at the time when they are accustomed to act.

The efficacy of purgatives is also markedly aided by a due consideration of the periods at which they ought to be given. A resinoid cathartic principle contained in pill is usually of slow and deliberate action, and may be given indifferently with meals—as in the case of dinner-pills—or on an empty stomach before bed-time; but saline purgatives generally act best when given fasting, as the veins of the intestinal tract are then less full and more predisposed to rapid absorption. As an illustration of this we need only refer to the much more potent effect of an ordinary seidlitz powder given before than after breakfast.

Anthelmintics, again, are always best given after as long a fast as possible, so that the parasites which they attack may not be shielded by food or mucus, and we find in practice that night, just before bed-time, is the most convenient period for their administration.

4. Dosage.—The relative efficiency of large and small doses is the next point which has to be taken into consideration; and here we are at once confronted by some of the most delicate and difficult questions in therapeutics—delicate because they border closely on the dangerous ground of homœopathy, difficult on account of their often unsettled nature. We cannot pretend to give any exhaustive discussion to this branch of our subject, because the materials for it are not forthcoming, but we can all contribute somewhat to its solution by experimental trials of various drugs given in these different ways. This much, however, we do know, that in many cases we get much more satisfactory results [in special emergencies, or temporary conditions] by giving one tolerably large dose at one time; and especially is this the case with narcotics, small quantities of which only excite and annoy, whilst a full dose satisfactorily brings about the desired result of sleep. Purgatives and emetics, again, are also best given in one considerable dose; tonics, astringents, diuretics, &c., require to be steadily repeated at certain short and regular intervals

[in order to have a sustained and continued effect]. But the true point at which we wish to arrive is this: Can we best obtain rapidly and efficiently the constitutional action of a drug such as belladonna, or aconite, by administering in average quantities two or three times a day, or by ordering it to be taken in very small doses often repeated? Now supposing we are called upon to treat a case of acute tonsillitis or catarrhal febrile disturbance, which we wish to remove as rapidly as possible, and we elect aconite as the special remedy to be used, we are taught by Ringer and others that the most reliable method for its administration is in drop or even half-drop doses every hour, half-hour, or even ten minutes. General experience has pretty well confirmed this teaching, and has extended it to other medicines, such as prussic acid, which will thus more effectually control urgent sickness than when given at longer intervals in the more orthodox way; to tartar emetic, which in very small and often-repeated quantities exercises a remarkable effect over infantile bronchitis; to ipecacuanha, which in minim doses will frequently check obstinate vomiting; to calomel and grey powder, which in minute doses, every half-hour, will often stop irritability of the stomach when nothing else will succeed. Instances of this sort will be multiplied as our consideration of the individual articles of the Pharmacopœia goes on, the principle being steadily kept in mind that we may often bring the system much more efficiently under the special influence of a drug, by ordering it in small quantity often repeated, than by giving full doses two or three times a day; and this necessarily applies with special force to those drugs which are rapidly thrown out of the system, and whose action upon the structure or function they are particularly supposed to effect, is thus kept up and, so to speak, perpetuated by very frequent administration.

On the other hand, we must not forget that certain medicines must be given in very large quantities before their physiological properties are obtained. Thus it would be useless to expect *succus conii* to tranquillise irregular muscular movement in less doses than $\text{f}\overline{\text{3}}\text{j}$. [Ph.B. The *succus conii*, U. S., cannot be safely given in such large amounts, as its strength is variable. Dose, to begin with, $\text{f}\overline{\text{3}}\text{ss}$.- j .], and frequently we require to give even more than this; belladonna is of no use in nocturnal inconti-

nence of urine unless boldly pushed up to $\text{f}\mathfrak{z}\text{j}$. or $\text{f}\mathfrak{z}\text{jss}$. of the tincture. [In this connection it should be borne in mind that the tincture of belladonna of the U. S. Pharmacopœia is twice the strength of the British.] Arsenic acts best in chorea when prescribed with no timid hand.

Another point of interest in connection with this enquiry is that, drugs often display different and even opposing actions, according as they are given in large or small doses. Thus we have seen that drop doses of *vin. ipecac.* will often check vomiting, whereas it is well known that a teaspoonful, or even less, will almost immediately evacuate the stomach; sulphate of zinc, in twenty or thirty grain doses, is prized as our best emetic, whilst it is equally established that from one to six grains is a valuable nervine tonic, much used by some physicians in the treatment of chorea. Small doses of opium excite, whilst large soothe into sleep; half-ounce doses of [*infusion of*] *digitalis* may be more safely given than those of $\text{f}\mathfrak{z}\text{j}$. [more frequently repeated]; the neutral salts of potash and soda are, as a rule, purgative in large, diuretic in small doses; and the other instances of this principle—which will afterwards be given—must be borne in the mind of the prescriber before he can pretend to make most efficient use of the weapons at his disposal.

5. **The Interval between Doses.**—The next heading to which reference is usually made is regarding how often we ought to repeat our dose of medicine; but this is so far involved in what has gone before, that very little remains to be said. The ordinary rule is to order our mixture to be taken three times a day, or every four hours, unless special circumstances, such as we have already indicated, render it advisable to repeat more frequently. Although many sick persons look forward to the time of taking their physic, and feel moral as well as physical support from the mere act of attending to their doctor's orders, the greater proportion are not so favorably impressed, and would willingly be relieved from the necessity of swallowing the often nauseous compounds they receive. Homœopaths, no doubt, derive much of their success from the tasteless nature of their medicines, and we have not yet devoted sufficient attention to the elegances and refinements of pharmacy. It is well, therefore, to direct our tonics and astringents, and drugs whose action is to be

spread over some considerable time, to be taken three times a day, always bearing in mind those important exceptions which recent investigation has done such good service in impressing upon our attention.

6. Individual Peculiarities; Idiosyncrasy; Habit.

—When the student has been fairly emancipated from the leading-strings of his teachers, and enters practice on his own account, he will often be disappointed at the way in which drugs play their allotted parts. The necessarily cut-and-dried and dogmatic descriptions of the text-books have led him to believe that such and such a medicine will always act in a particular way, and he accordingly prescribes it with full confidence in a given case. But not only may the proper effects fail of development, but very unpleasant and almost unlooked-for symptoms may follow its use, which will be productive of much discomfort and uncertainty, and may even tend to shake his professional credit. The influence of that strange individual peculiarity, usually termed idiosyncrasy, and of which no reasonable explanation has ever been given, must be very carefully taken into account in prescribing, and we shall refer to it on all suitable occasions. Sometimes it renders our patient unduly susceptible to the action of drugs, and thus we may find one person seriously salivated by one grain of calomel, another who dare not touch quinine, a third who is furiously excited by opium, whilst a fourth may be poisoned by a single-grain of morphia. Phosphorus and bromide of potassium also cause their peculiar effects in very small doses. A good precaution, therefore, is, before prescribing any of these drugs, to ascertain from the patient whether he has ever taken any of them before, and whether no uncomfortable effects could be in any way attributable to their use. But, on the other hand, our patient's constitution may be such that very large quantities of drugs will alone succeed in acting; and remarkable stories are told by Christison and others of the immense quantities of opium which persons quite unaccustomed to its use have been occasionally able to take with impunity. Purgatives act very differently on different people, and others require immense quantities of anæsthetic vapor before full insensibility is obtained. Although, as I have just said, we may often anticipate uncomfortable effects by due preliminary inquiry, it too often happens that they

come on suddenly, and quite unexpectedly. Idiosyncrasy is so wide-spread and deep-rooted in the human constitution, in almost every function and action, that we can hardly hope ever to obtain the key to its mysteries. Why, may we ask, do particular articles of diet disagree with special persons? Why does one person, on exposure to cold, take a simple catarrh, whilst a second becomes a prey to rheumatic fever, and a third escapes unharmed? Why do we all differ from one another in some minor degree in almost everything that we do? Until we can clear up these problems, it is vain for us to attempt to explain why we require to adapt our doses so carefully to individual constitution and peculiarity; and the reason why the student is at first perplexed by all this is that we meet with these differences much more frequently in the upper ranks of society. The hospital or dispensary patient swallows any dose, however nauseous, with much satisfaction, and is much less often affected by those troubles of irregular physiological action which so frequently harass the family medical attendant in more aristocratic circles.

The influence of habit on therapeutics is also worthy of every consideration, for we shall find in practice that medicines often lose their effect when continued for any lengthened period. More especially is this the case with opiates and narcotics generally, the dose of which requires to be gradually increased from time to time. Arsenic has the same peculiarity, as is shown in the case of the arsenic-eaters of Styria, who, by long continuance in the use of that substance, are at last able to consume quantities which would inevitably prove fatal to a novice. And this leads to the question of toleration, an old-fashioned term dating from the days of heavy dosing with irritating metallic substances, but having sufficient bearing on modern practice to justify its consideration here. We have said that the term toleration savors somewhat of antiquity, because the great illustration of this principle used to be afforded by tartar emetic, which was then much more freely used than now in acute inflammations; and when I say antiquity I do not refer to anything more remote than perhaps half a century ago. Then the contra-stimulant treatment of pneumonia was in full swing, and the curious fact became gradually known that, although the first doses of tartar emetic often caused much nausea and depression, subse-

quent larger quantities were well borne ; and this was explained by what was called toleration of the drug being established in the system. It will be seen, when we come to consider in detail the actions and uses of tartar emetic, that a very sufficient and scientific explanation can be given of this somewhat mysterious effect. In these days, inflammatory action is treated on somewhat different principles, and antimony is comparatively little used ; but the principle of toleration can be recognized in the use of other drugs. Thus, in dysentery, quantities of ipecacuanha are given which would infallibly produce violent vomiting in a healthy subject ; arsenic is better borne in skin disease than in a state of health ; choreic patients are able to swallow almost emetic doses of zinc sulphate without the action of vomiting being induced. Digitalis is well known to be given freely in delirium tremens, and there is little doubt that the experiment of prescribing half an ounce of the tincture to a person in ordinary health would be productive of serious if not fatal consequences. Further instances of toleration might readily be adduced, but it will be much more to the advantage of the student to recommend him to pick out other examples for himself than to provide him with a cut-and-dried list of all that is known on the subject.

7. Constitutional, or Toxic, Effect from Small Doses.—We next come to what is commonly known as *accumulation*, the theory of which is that certain drugs rest or become stored up in the system until they reach a dangerous quantity, when inconvenient or poisonous symptoms may result. Thus we know that after a certain continuance in the use of digitalis, faintness and depression have often been observed, that strychnia may cause uncomfortable twitchings after it has been taken for some time, that bromide of potassium only begins to cause annoyance when the system seems to have become saturated with the salt. Does this really mean that these substances have reached the point beyond which their poisonous action is neutralised, so to speak, by the symptoms which their therapeutical powers attack, or is the defect in the organs of elimination which fail to expel them efficiently from the system ? It is probable that both these and the numerous other examples which our subsequent pages will contain depend on both these causes in some degree, in addition

to another, and that is that the organ or tissue towards which the physiological action of the drug is directed is, after long-continued stimulation by repeated small doses, worked up into a certain condition of special excitement or depression, and discharges accordingly. Thus we find the twitchings from strychnia, the cardiac depression of digitalis, the nervous weakness and ataxy from bromide of potassium, the paralysis resulting from alcohol. The metals, as mercury, arsenic, &c., on the other hand, no doubt act by being stored up within the tissues, and brought into excessive action by some defect of elimination.

And the practical outcome is, that in prescribing many of these drugs, and more especially digitalis, strychnia, and bromide of potassium, it is well to have an occasional break, to omit our prescription for a day or two, so as to give the parts a rest, and enable the remedy to act afterwards with better effect in even diminished dose.

8. Chemical and Physiological Incompatibilities.

—And now we come to the doctrine of incompatibility, which is of all-essential importance in therapeutics, consisting as it does of the principles which we require to know in order to avoid that amount of clashing of the different ingredients of our prescription which may either alter or destroy their action. Now incompatibility may be of different sorts, and is generally divided into chemical and physiological. Of these we will first consider chemical incompatibility.

This consists in the chemical reactions of one drug on another, which may result in the formation of a new compound when they are mixed. Thus the addition of iron to decoction of cinchona will produce an unsightly, black mixture; strychnia and perchloride of mercury will not go with gelatine; sulphuric acid and lead form an insoluble sulphate. A good deal of this incompatibility, however, is inconvenient, principally, because the resulting solution is often thick, turbid, and unsightly, and therefore repugnant to the patient. Many most incompatible mixtures are therapeutically efficient, and some are even prescribed deliberately. Quite otherwise is it, however, with the second group, or the physiological incompatibles, the *rationale* of which is that the action of one drug is so far antagonistic to that of another that the mixture of the two

is necessarily inert. Thus the combination of belladonna and opium is in some degree opposed, atropia and prussic acid, aconite and digitalis, strychnia and Calabar bean, and, most markedly of all, caustic alkalies with belladonna, hyoscyamus, stramonium, or tobacco, all of whose active principles are thus absolutely destroyed.

But, as already hinted, we often prescribe an incompatible mixture for the purpose of actually deriving therapeutic advantage from the resulting compound. Thus what is a more generally used and, I may confidently say, more useful prescription than perchloride of mercury and iodide of potassium, making an iodide of mercury which is much more efficacious than that salt itself as prepared by more elaborate chemical agency?¹ Again, the far-famed *mist. ferri co.* derives much of its charm from the freshly prepared carbonate of iron which results from the due combination of *ferri sulph.* and *pot. carb.* Black wash is another example; and although corrosive sublimate and decoction of bark are undoubtedly incompatible, no better means is known of counteracting the depressing effects of this preparation of mercury.

9. Prescribing for Children.—A few words may now be said on the art of prescribing for children, a subject which is only incidentally touched upon in our ordinary books, and is then treated in a somewhat misleading manner. Elaborate tables have, however, been drawn up for the regulation of doses according to age, and in all of these it is assumed that young children necessarily require much smaller doses of most drugs than adults; and this is true in so far that it is seldom advisable to deal out our mixtures to them in the time-honored tablespoonful or two tablespoonfuls of their elders. But the important fact which these systems invariably ignore is this, that children can often take, not only with impunity but even with decided benefit, quantities of active remedies which will correspond to a full adult dose. And the reason of this may be looked for in the much greater destruction and construction of tissue

¹ [Theoretically these salts in solution are chemically incompatible, as a reaction takes place, and a precipitate is formed. This precipitate, however, is soluble in an excess of iodide of potassium, forming an uncertain compound, which may be looked upon as a hydrargyropotassic iodide, dissolved in a solution of potassic chloride, with other compounds not yet determined.]

in early life, whereby the organs of elimination are in unusual activity, and hence disposed to excrete medicinal substances with special promptitude. Whether we accept this explanation or not, however, I may warn the young practitioner that an adherence to the rules usually laid down for children's prescriptions will cause him serious disappointment, and that he will be surprised at the beneficial results which will follow the adoption of a bolder course [in special instances].

To furnish a few examples of this proposition, I will begin with belladonna, which may be used very freely in childhood, and the dose of which I have pushed in a child of 10 suffering from incontinence of urine to fʒij.¹ with good effect, and the development of only very mild forms of physiological disturbance. I commonly begin with ℥xx.¹ in a child of 2 or 3, and have prescribed ℥x.¹ in an infant of six months with remarkable benefit; and the result of my experience undoubtedly is, that children bear belladonna actually better than grown-up persons, and that in them really poisonous symptoms rarely if ever occur. I may add that this strange insusceptibility of children to belladonna was first pointed out by the late Dr. Fuller, and has since been abundantly confirmed by Dickinson, Ringer, Kelly, and others.

Arsenic may also be freely given to children, and, at the age of 5 or 6, I should have no hesitation in beginning with ℥v. [of Fowler's solution] and pushing even up to ℥x. if necessary. Prussic acid [dilute] may be given in ℥j. to ℥iij. doses at the same age. Strychnia is also well borne. Tinct. ferri may be taken in large quantities, and I have seen excellent results follow the administration of fʒj. ter die, in a little girl of 6.

Children will often require large purgative doses, more especially of pulv. jalap. co., and of ipecacuanha as an emetic. I have often ordered quantities which have startled the dispenser and induced him to come for explanation under the idea that I had made a mistake. Bromide of potassium may also be freely given, and other instances will be noted as we go on, remembering always the sound old advice to be very careful with opium at an early period of life. Every practitioner has

¹ [British Pharmacopœia.]

no doubt seen cases in which ill results have unexpectedly followed laudanum prescribed before the age of 1 year, and I cannot do more than reiterate the warnings on this subject which every manual of materia medica most properly contains. Other points must also be attended to in prescribing for children.

[A philosophical method of graduating doses for children has been proposed by Prof. Clarke. It is based upon the weight of the subject, the full, adult dose being considered as appropriate to a weight of one hundred and fifty pounds. The proportion of a full dose in each case would thus be represented by a fraction whose denominator should be 150 and the numerator the weight of the patient. Perhaps a more practical rule is this, proposed by Dr. Cowling. "The proportional dose for any age under adult life is represented by the number of the following birthday divided by twenty-four;" thus, for one year $\frac{2}{24} = \frac{1}{12}$; for five years $\frac{6}{24} = \frac{1}{4}$, etc.]

It is always well to make our dose as small as possible, one or two teaspoonfuls being usually sufficient, and great pains must be taken, by means of well-adjusted flavoring ingredients, to disguise the too often nauseous taste of our drugs. Various syrups and aromatic waters here stand us in good stead, and it is well if possible, when dealing with very young infants, so to reduce the bulk of the medicine as to enable it to be mixed unobserved with milk, veal broth, beef-tea, or some sort of confection. In this there is nothing really antagonistic to the principle which has just been developed, as we can readily enough give considerable quantities of belladonna, arsenic, etc., in comparatively small quantities of water, or even in none at all.

Children are, however, somewhat strangely capricious in their taste; for whilst they object decidedly to bitter or acid substances, they will take oils readily, and generally seem to derive satisfaction from sucking in cod-liver oil. Nauseous powders which would seem inexpressibly revolting to their elders, they often take well, and by a little contriving and consideration we can generally manage to persuade them to consume their dose with philosophic composure, if not with actual relish.

10. Prescription Writing.—We next come to the construction, or what we may call the anatomy, of the prescription itself, how it is put together, and how its com-

ponent parts are arranged ; and we commence with the 'R' with which it begins, and which really means an old invocation to Jupiter. But conventionally it has been held to imply the verb *recipe*, which governs the quantity in the accusative, the name of the medicine being put in the genitive. Thus, *Recipe* (take) *pulveris* (of powder) *scammoniae* (of scammony) *scrupulum*, &c. Other directions are laid down in books which deal with this question, and much valuable information is contained in Pereira's 'Selectæ Præscriptis' and the clear and instructive little work of Dr. Griffith, of Dublin ; but it is hardly necessary to reproduce these here, as students beginning their medical curriculum are presumably sufficiently well grounded in classics to enable them to understand the very moderate amount of Latin required for their use in prescribing. As a rule, medical men generally write their directions now-a-days in English ; and this has not only the advantage of limiting the chance of mistake, but it does away with much of that mystery which beyond anything else has tended to keep back the progress of our art. In these enlightened times, when even more than a smattering of physic is commonly possessed by the laity, we do not find our patients quietly consenting to be kept in the dark as to what medicines they are taking. Rather we find them showing a keen interest in our prescriptions, anxious to enquire, and argue, and if possible understand, all about the line of treatment we have determined to pursue. The cases are very rare in which it is necessary to conceal from them the presence of any particular drug in their mixture, and Latin directions are therefore not only unnecessary, but pedantic in the highest degree. It is still, however, the custom at the examining boards to ask the candidates either to write or read, or both, prescriptions fully constructed according to this custom, and in the prescriptions which we shall frequently add to our descriptions of the various drugs we shall invariably give the directions in Latin of the usual form.

II. Weights and Measures.—It only remains for us, then, to add the signs and symbols in general use, which are as follows :—

gr., granum . . .	= a grain.
℥, scrupulum (scruple) .	= 20 gr.
℥, drachma (drachm) .	= 3 scruples, or 60 grains.
℥, uncia (ounce troy) .	= 480 grains [or 8 drachms].
lb., libra (pound) .	= 12 ounces troy [5760 grs.]
℥, minimum (minim) .	= $\frac{1}{60}$ th part of a fluid drachm.
gtt., gutta (drop) .	= usually about $\frac{1}{2}$ minim.
[f℥, fluidrachma (fluid drachm)]	= 60 minims.]
[f℥, fluiduncia (fluid ounce)]	= 8 fluid drachms.]
℔, octarius (pint) .	= [16 fluid ounces, U. S. P.] 20 oz. [Imperial measure]
C, congius (gallon) .	= [8 pints.]

In the British Pharmacopœia the time-honored drachm and scruple weights have been discarded, and all who prescribe or dispense medicines are recommended to discontinue their use; but old-fashioned customs are not so readily swept away, and we accordingly find these most convenient terms flourishing as much as ever. In domestic practice we find a much more rough and ready mode of prescribing, the generally received measurements being as follows:—

Teaspoonful . .	= 1 fluid drachm.
Desertspoonful . .	= 2 fluid drachms.
Tablespoonful . .	= 4 fluid drachms.
Wineglassful . .	= 1½ to 2 fluid ounces.
Teacupful . .	= 5 fluid ounces.
Breakfast-cupful . .	= 8 fluid ounces.
Tumbler . .	= 10 to 12 fluid ounces.

Of all domestic modes of measurement, however, none can equal the drop in fallacy and danger. The size of a drop is influenced first by the shape of the bottle, and secondly by the quality of the fluid itself, and hardly two substances will be found to contain the same number of drops in a given quantity.

Tablespoons, teaspoons, and all domestic measures are most absurdly variable in size, and we shall do well steadily to discountenance their use in all cases, and to insist that our patient shall carefully regulate his dose by means of those graduated glasses which are within the reach of all but the very poorest.

12. Observations upon Doses.—Now, although it would manifestly be lulling our readers into a false secu-

rity, were we to attempt to lay down any absolute rules respecting dosage, we may venture to state some broad principles which will help the memory. Students often complain of the great difficulty they experience in remembering doses, and at first sight it would appear a most irksome task for a person not in the habit of prescribing to carry in his mind the major and minor quantities of drugs which he may safely order. But by giving a few rules, and adding exceptions, as in the Latin grammar, we hope to show that there is no real difficulty here, but that we may safely group substances in such a way as to associate their doses with one another with tolerable simplicity. But first let me say one word about the British Pharmacopœia. Constructed as it was by official authority several years ago, it is naturally looked upon as our *vade mecum*, and every student is supposed to possess a copy and to make himself familiar with its contents. Now, in the first edition no doses were given, and in the next, although these were added in deference to a universal request, it was expressly stated that they were not to be considered authoritative, or specially enforced by the Medical Council. But the Pharmacopœia, being the only official guide, has now been forced into a position respecting dosage which it did not intend or desire, and we therefore find that in any case of difficulty its authority is invariably appealed to. It lies on every druggist's counter, it is the standard in courts of justice, and, this being the case, it ought to reflect the most advanced researches on its subject. But this is not so; on many points its recommendations are hopelessly at variance with modern practice, and we are hence exposed to the annoyance and possible discredit of having our prescription sent back or cut down by druggists who are afraid of exceeding the dose sanctioned by authority. Thus the maximum dose of *succus conii* is fixed by the Pharmacopœia at ℥j., of quinine at gr. x., *digitalis* fʒj.; and when we come to consider the various substances in succession, we shall find many other examples of a discrepancy between my teaching and its statements, which this explanation will clear up. [These difficulties are happily avoided by the United States Pharmacopœia, the doses of remedies being judiciously omitted.]

13. General Rule for Doses.—We may now proceed to indicate the natural system of grouping, by which some

order may be given to the arrangement of the doses of drugs in the already crowded brain of the student or the young practitioner.

Thus let him remember that, as a general rule, tinctures may be prescribed in doses of from $\text{f}\overline{\text{3}}\text{ss.}$ to $\text{f}\overline{\text{3}}\text{ij.}$, infusions and decoctions from $\text{f}\overline{\text{3}}\text{ss.}$ to $\text{f}\overline{\text{3}}\text{ij.}$, powders from two to ten grains, pills four to ten grains; and although there are numerous and very important exceptions to this, the recollection of the principle will spare us from the drudgery of placing the exact dose after every preparation whose action we shall examine.

[The following are the important exceptions to this rule, the dose of each of which should be learned separately.

Tinctura aconiti radici, U. S. P.		Tinctura nucis vomicæ, U. S. P.	
" belladonnæ,	"	" opii,	"
" cannabis,	"	" acetata,	"
" cantharidis,	"	" deodorata,	"
" colchici,	"	" scillæ,	"
" conii,	"	" stramonii,	"
" digitalis,	"	" veratri viridis,	"
" ferri chloridi,	"	Infusum digitalis,	"
" hyoscyami,	"	" capsici,	"
" iodinii,	"	" tabaci,	"]
" iodinii composita,	"		

These rules may be borne in mind in a general way, and we shall now go on to consider very briefly the plan of arrangement to be pursued when we come to consider the various medicinal substances seriatim.

Our object will be to balance, as far as possible, their physiological against their therapeutical action, arranging them in corresponding columns in diagrammatic form; and it will greatly assist this arrangement, as well as aid the memory of the student, if we adopt the following order in stating what we know respecting the properties of each drug.

Take, first, its local or external action.

Then its influence on the brain and on the spinal and sympathetic system of nerves.

This will lead us up gradually to the effects on the heart and bloodvessels, whose functions are presided over, and ruled by, nervous influence.

The effects of the drug on respiration and temperature will next be considered, and we then proceed to the alterations of secretion in the following order: urinary, intestinal, salivary, cutaneous, &c.

Then other actions which come under no heading, and which may be called specific.

Finally, we must consider the various modes of elimination from the body, the antidotes, contra-indications, and best modes of prescribing, winding up, in most cases, with a prescription which will, as far as possible, combine efficiency and elegance with palatability.

It will of course often happen that we cannot accurately balance the physiological against the therapeutical action of a drug, either from want of sufficient knowledge or from an excess of facts of more or less conflicting nature. We must remember that our therapeutical evidence is derived from clinical observation on man, and that experiment on the lower animals has supplied us with most of our knowledge respecting the action of medicinal agents on the healthy organism. Fallacies may readily creep into both these methods of investigation, and it is evident how the clinical method may be hampered by our want of full knowledge of the natural history of disease. Although late years have done a good deal in showing how various acute maladies behave, when uncomplicated in their course, by active medication, we are still much in the dark, and too prone to confuse the *propter* with the *post*. And the results of the very elaborate system of experimentation which has lately been carried on in Germany and elsewhere cannot be accepted as fully conclusive of the physiological action of the various drugs on man. One source of fallacy undoubtedly lies in the very differing susceptibility of certain members of the brute creation to certain drugs. Thus rabbits freely digest belladonna as well as opium; it is difficult to poison pigeons with strychnia, or fowls with prussic acid; and other instances of this curious law have been placed on record. It is therefore reasonable to suppose that the special structure and habits of the lower animals exercise an equally modifying influence with regard to the special action of medicinal substances on special organs and functions, so that we must be prepared to receive some facts drawn from this source with a certain amount of reserve. In addition to this, the shock and

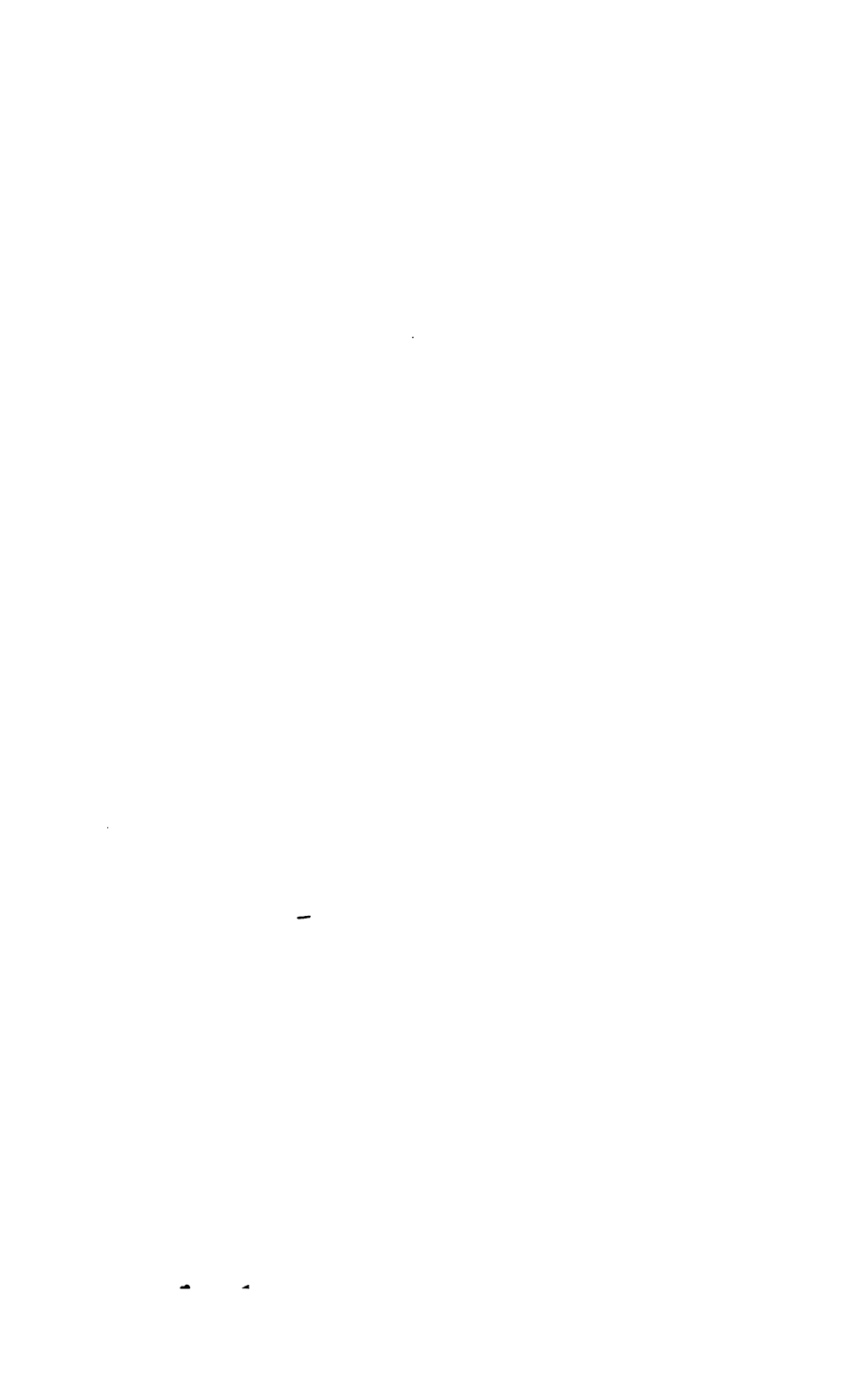
general damage inflicted on the victims of experiment by the necessary manipulations must frequently alter so seriously the conditions of secretion as to render any deductions on this score very inconclusive; whilst, finally, it is well known that drugs which appear to have no action on a special organ whilst in health may very materially modify its condition when congestion or any other form of morbid action has set in. In looking over, therefore, the large mass of evidence furnished by the industry of able physiologists, we cannot fail to be struck by the discrepancy which exists occasionally between the results obtained. Different observers experimenting in different ways now and then get different results, and in no case has this been more distinctly shown than by the way in which the labors of the celebrated Edinburgh Committee have been practically set aside by later investigators, who have shown that mercurials, as well as other drugs, actually do increase the biliary secretion. We must therefore bear all this in mind, and endeavor so to sift all our evidence as to place on our tables only that which the opinion of our best authorities has thoroughly and fully endorsed.

Regarding the method in which the following pages will be arranged, a few words may be said.

Different modes of grouping drugs have been adopted, and by some the preference is given to the purely physiological plan, by which all the medical substances having a particular action are placed under that special heading; thus we have purgatives, narcotics, astringents, etc., as different varieties, with their attendant species. No doubt such a plan has the merit of scientific precision, and, had each drug only one medicinal action, nothing could be simpler or more effective than this arrangement, of which Neligan is the chief exponent. But an unfortunate element of complication is introduced by the fact that one drug may act in many and indeed opposing ways. Thus, whilst opium is an astringent, it has every right, under certain circumstances, to be called a purgative; its stimulant action is as evident as its narcotic; it is a diaphoretic, a sedative, an antiphlogistic; and the confusion inseparable from hunting it about among its various headings must necessarily be perplexing to the mind of the student, as well as occasion loss of time. Many other drugs behave in the same way; so it has been thought best to adopt the

arrangement of Garrod and other popular text-books, in which the inorganic substances are placed alphabetically, and the organic in accordance with the natural orders to which they belong. We shall only venture to make one modification, and that will be to remove the general principles of therapeutics from its usual position at the end of the book, and scatter its classification systematically through our pages. For instance, after treating of the leading member of the purgative or narcotic group, we shall use that as a peg on which to hang a general description of that class of substances in general, and in this way we may hope to relieve that tedium which is apt to arise when too many deductions and generalizations are presented *en masse*.

[In preparing an American edition it has been deemed advisable to adhere strictly to the alphabetical arrangement just mentioned. In the following pages, every remedy included in the Primary List of the *Materia Medica* of the United States Pharmacopœia is presented in regular order, new titles being introduced when necessary in order to make the list complete. When botanical or chemical definitions are given in the Pharmacopœia, they also are herein reproduced, the customary doses affixed to remedies adapted to internal use, and, wherever practicable, the composition and strength of the officinal preparations are also indicated. Some prominent remedies of the U. S. Secondary List, with others not yet officinal, are arranged in like manner in a separate section. In order to render the plan of the work more harmonious and consistent, and add to its essentially practical character, it has been considered proper to collect together the scattered paragraphs upon the principles of therapeutics and to group them together, devoting a special chapter to their consideration under the title of Remarks on Certain Classes of Remedies.]



REMARKS

ON

CERTAIN CLASSES OF REMEDIES.

ANTIDOTES.

The first thing to be done in any case of poisoning is to empty the stomach, and to eliminate the poisonous substance from the tissues.

This may be effected in the first place by emetics, and more especially those of the direct class; but it will often happen, particularly in narcotic poisoning, that emetics will not act, and that we are forced to have recourse to the stomach-pump. Caution in the use of this instrument, however, is requisite in cases of irritant poisoning in which the mucous membrane of the stomach is softened or partially destroyed. When evacuation of the stomach has been completed, we may employ gentle purgatives and diuretics in addition to such remedies as iodide of potassium, which favor the elimination of metallic substances.

The next stage in our proceedings must be to obviate the tendency to death, according to the various vital processes attacked by the poison.

Thus, if cardiac syncope be the main symptom, we must give stimulants; if the respiratory centre seems in danger of becoming paralyzed, we must excite respi-

ratory action by cold affusion, irritation of the skin, and the employment of artificial respiration, and give atropia, which stimulates the origin of the pneumogastric nerve in the medulla; if narcosis prevail, we must endeavor to rouse the brain; and if irritation of any particular organ arises, we must soothe it by appropriate remedies.

Having got so far, we must then proceed to use our antidotes proper, which may be divided into (1) Chemical, which directly neutralize the action of the poison by destroying its properties; and (2) Physiological, which have distinctly antagonistic properties, being, indeed, in many cases, absolute counter-poisons.

1. Among the first class we may rank alkalies in acid poisoning, animal charcoal as rendering the vegetable alkaloids innocuous, and liquor potassæ as depriving belladonna and its congeners of all physiological power.

2. The second contains all those various substances which have been described here and there in these pages as directly antagonistic to one another, as opium within certain limits to belladonna, Calabar bean to atropia and strychnia, aconite to digitalis; and this class of antidotes has the advantage over the more purely local or chemical, that they are able to pursue their foe into the blood, and attack it boldly and successfully there.

ACIDS.

We next come to the consideration of acids, and, before enumerating the therapeutic properties of each individual member of the group, it will save time and repetition if we

draw attention to the collective actions and uses of acids in general.

EXTERNAL ACTION.

Physiological.

Acids, being possessed of high diffusive power, rapidly permeate tissues to which they may be applied, coagulate their albumen, and, if concentrated, absorb their watery constituents and cause their destruction.

Therapeutical.

Acids, if used in concentrated form, therefore, act as *caustics*, eating away and destroying animal tissues. When more diluted they are *astringents*, hardening and constricting weakened parts and checking unhealthy secretions.

INTERNAL ACTION.

1. *On Circulation.*—It is stated that phosphoric and acetic acids diminish the force and frequency of the pulse, and reduce the number of blood corpuscles.

All the acids, however, have the property of increasing the acidity of the blood, probably rather by setting free another acid than by a direct action on that fluid; for by the time they enter the circulation they are themselves converted in great measure into salts by the various alkaline secretions with which they have come in contact.

They may also contract the smaller blood-vessels by reflex action, or by directly astringing them locally.

2. No special effects on the *respiration* or *nervous system* have been noted, but phos-

The action of acids in checking hemorrhage is thus explained, as there is no doubt that coagulation [of fibrin in the vessels is prevented, and its fluid condition normally maintained and] encouraged by an alkaline condition of the blood.

They are useful in internal hemorrhage, and to check excessive perspiration.

phoric and acetic acids are said slightly to lower the temperature.

3. Their action on *secretion* is interesting, and has been specially pointed out by Klinger. It appears that an acid applied to the orifice of a gland secreting an acid fluid will check that secretion, and thus any member of this group taken into the stomach before or at the beginning of the process of digestion will tend to act unfavorably by stopping the flow of gastric juice.

This physiological action points to a valuable bearing on therapeutics. Some cases of dyspepsia depend on a deficient production of gastric juice, enough of this fluid not being secreted under the stimulus of food to dissolve and digest the albuminous constituents. This condition may be remedied by mechanically supplying the want by a little acid given some time after food. But again, still more cases of disordered digestion are caused by an excessive formation of gastric juice, the surplus supply of acid teasing and worrying the mucous membrane of the stomach, and causing pain, sour eructations, and general distress. Here our physiological law comes into play, and we check the over-secretion by giving the acid immediately before the meal. Or again, discomfort may result from irregular or excessive fermentation of food giving rise to the formation of a large quantity of acetic, butyric, and lactic acids; and this undue fermentation is found to be itself directly controlled by acids given in this case after food. Possibly some of their influence in checking acid perspiration may be due to this law.

But if acids arrest secretions having their own chemical reaction, they stimulate those which are alkaline, markedly increasing their quantity.

We can thus explain what has been called the refrigerant action of acids, or their undoubted influence in relieving thirst and imparting a fictitious sensation of coolness. By stimulating the secretion of the salivary glands, we moisten the dry parched mouth of our fever patient, and quench his thirst perhaps better than in any other way.

It is probable also that some at least of the beneficial influence exerted by acids on chronic biliary derangement is due to their directly increasing the flow of alkaline fluid from the liver.

4. *On the Urine.*—Acids increase somewhat the acidity of the normal urine, but have no power of rendering an alkaline urine acid. This property is alone possessed by benzoic and citric acids, which are not true acids in the chemical sense.

Acids, by their astringent properties, brace up relaxed mucous membranes, and check unhealthy secretion.

They are therefore good tonics, and act well in diarrhœa and profuse sweating.

DISADVANTAGES.

The prolonged use of acids is apt to exercise a very unfavorable influence on digestion, rendering persons pale and languid, and causing a good deal of emaciation; and this was no doubt the secret of the action of vinegar in reducing corpulence, which used to be so highly prized in the Byronic days, and by incautious indulgence in which

so many ignorant people have at various times ruined their health.

POISONOUS EFFECTS.

The symptoms consist of very violent burning pain in the stomach and intestines, vomiting, purging, intense prostration, and death either by shock or by the results of secondary inflammation. On *post-mortem* examination, intense inflammation of the stomach and intestines is found, with ulceration of the mucous membrane, and even perforation into the peritoneal cavity; and if the case is of a more lingering character, fatty degeneration of various internal organs, but more especially the kidneys, becomes gradually developed.

ANTHELMINTICS.

The human body being infested with various parasites whose presence is inconvenient and even dangerous, it is necessary for us to be provided with means for their safe and speedy removal. Some of these unwelcome guests are, unfortunately, out of the range of medicine, but others are so placed that they can readily be destroyed; and we shall arrange them in classes, according to the special drugs which act specially upon them.

1. **Tape-worms**, as the *tænia solium*, derived from eating measly pork; the *tænia medio-canellata*, from veal or beef; and the *tænia lata*, from salmon. These occupy the small intestines, and give rise to various ill-defined but uncomfortable sensations.

1. The best remedy for the *tæniæ* is now allowed to be male-fern oil given on an empty stomach; but if this should possibly fail, we may have recourse to kousso, turpentine, pomegranate root, or areca nut.

We must remember that, although these remedies kill the worms, they do not necessarily expel them from the intestines, and that a purgative may be required for this purpose; and it is also essential to find the head of the tape-worm be-

2. The **round-worm**, or **ascaris lumbricoides**, inhabiting the small intestine, and occasioning a long array of nervous symptoms, more especially in children. They are supposed to be introduced into the system by impure water.

3. The **thread-worm**, or **oxyuris vermicularis**, found in the cæcum or colon, and causing much itching and irritation. They are almost universal among the children of the poor, but opinions differ as to whether they must be regarded as the cause or the effect of the peculiarly cachectic condition with which their presence so often coincides.

Other forms of parasitic intrusion within the various tissues are well known, but are generally incurable; and the *trichina spiralis*, the various forms of hydatid disease, &c., must usually be permitted to run their destructive course unchecked.

fore we can assure our patient that he is freed from his tormentor.

2. Santonin acts as a true specific in at once destroying these troublesome parasites.

3. It would seem rather a roundabout practice to attack parasites in the lower gut by drugs administered through the mouth; and although purgatives, such as scammony, calomel, jalap, &c., are of use in these cases, our chief reliance must be placed on enemata of quassia, tincture of iron, lime-water, common salt, &c.

In the general treatment of parasites, we must not trust entirely, however, to the use of anthelmintics, but must also exclude all possibility of infection by forbidding raw or underdone meat or fish, and by insuring general cleanliness and an efficient water-supply. In addition to this, we must remedy the unhealthy condition of mucous membrane, which favors their development, by giving alkaline remedies and bitter tonics in various forms of combination.

In prescribing our remedies for the expulsion of the tape-worm, it is well to insure a thorough evacuation of the intestines, so that the parasite may not be in any way shielded from the action of the drug by food or mucus. After a preliminary purge, we direct our patient to fast for a few hours, and then administer the fern oil in milk, either at bed-time or in early morning.

ANTIPYRETICS AND REFRIGERANTS.

ANTIPYRETICS.

Antipyretics are remedies which reduce the bodily temperature, some acting only against the preternatural heat of febrile conditions, whilst others can also cool down the natural warmth below the normal standard. We may thus divide their action :—

Class 1. Those which act by directly cooling the surface of the body by local application.

Class 2. Those which act by internal administration, either lessening oxidation,

In this country we are not much in the habit of regarding the temperature, *per se*, as a special element of danger, unless it goes beyond a certain height, and we therefore do not, as a rule, treat this symptom very energetically. Foreign experience seems to show that, although we may reduce the actual heat in acute disease, we do not necessarily alter the course of the attack, and we therefore usually confine our efforts to supporting our patient and looking out for complications. On the other hand, however, when the thermometer registers 105° , and still tends upwards, we are bound to interfere.

1. This is undoubtedly our most effectual antipyretic means, and may be carried out by cold affusion, wet pack, or, best of all, by the carefully graduated cold bath.

2. This class consists of the antipyretic drugs, properly so called, such as qui-

or exerting some special influence on the nervous system.

Class 3. Those which act by dilating the superficial vessels and enabling a larger sheet of blood to be spread over the cutaneous surface, and thus brought in contact with the cooling influence of the air. The chilling effect then produced by the return of the circulating fluid to the heated centres, although very transient, may become considerable by repetition.

Class 4. Remedies which act by bracing up and strengthening the nervous system, and removing some of that enfeebled and semi-paralyzed condition on which febrile temperatures have been supposed to depend.

nine, digitalis, veratria, alcohol, salicylic acid, &c. ; but, with the exception of the last-named, they are not much used for this purpose.

3. Under this heading we must include the whole class of diaphoretics, as well as chloral hydrate, the warm and Turkish bath, &c.

4. A rising temperature being often an indication of debility, we may then check it by tonics, good food, small doses of alcohol, &c.

REFRIGERANTS.

Refrigerants, of course, necessarily include all remedies which actually lower the bodily temperature, but the conventionally accepted meaning of the term merely implies anything which alleviates thirst. Thus we find that the mere sipping of any fluid moistens the dry tongue and lessens the thirst of fever, whilst acids, by stimulating the secretion of saliva, may fulfil the same indication in a more scientific and effectual way.

ANTISEPTICS AND DISINFECTANTS.

Dr. Parkes proposed that the term disinfectant should be restricted to those substances which arrest the spread of specific disease depending on the entrance into the body of

a special agent *ab externo*, and that agents acting in other ways should be called air purifiers and sewage deodorants. It would seem well, however, to adhere in these pages to the nomenclature most commonly in use in our received text-books of *Materia Medica*, and, whilst willingly conceding the palm of scientific precision to Professor Parkes, I shall adopt the following division of the subject into disinfectants and antiseptics.

Disinfectants are those substances which act by destroying offensive animal or vegetable effluences, arresting putrefaction, and stopping the spread of infectious and epidemic disease by destroying the particles on which the poison of these diseases is supposed to depend. How they do this is not matter of absolute certainty, but they act in many cases by direct chemical agency, by deoxidising, or by taking up hydrogen and water; and the theory of the *modus operandi* of various substances here enumerated will be considered when each of them comes separately under review. Adopting, then, in some measure the nomenclature of Parkes, disinfectants may be divided into

1. Air purifiers, which we may again subdivide into—

(1) Solid air purifiers, of which charcoal is the best, also dried earth, quick lime, &c.

(2) Liquid air purifiers; Condý's fluid, zinc chloride, lead nitrate, and,

(3) Gaseous air purifiers; such as zinc, chlorine, iodine, bromine, nitrous acid, sulphurous acid, and carbolic acid.

2. We may next include the sewage deodorants, of which charcoal, dry earth, as in Moule's patent system, iron perchloride, quick lime, potassic permanganate, carbolic acid, with the various powders, such as M'Dougall's and Calvert's, which are prepared from it, are the most prominent.

3. Finally we have what Dr. Parkes calls disinfectants proper, which arrest contagious disease by destroying the particles of matter which pass away from the bodies of the sick. Of these heat is a valuable member, it being now well known that a dry heat, as of an oven, at over 212° will completely disinfect clothes.

Chlorine is effectual, but irritating; nitrous acid vapor has been recommended, carbolic acid is of undoubted service, but sulphate of iron seems to be of very doubtful utility.

Antiseptics are those substances which arrest the spread of disease and decomposition generally, not by chemical action, but by a poisonous effect on the minute animal or vegetable germs on which these processes depend. It is therefore clear that they dovetail very essentially with the preceding group, more especially as it is difficult to draw a hard and fast line between those disinfectants which act chemically and those which arrest putrefaction and infective processes in other ways. The term antiseptic, therefore, is superfluous, and would probably have dropped altogether out of use had it not been for the term antiseptic surgery, which has been so extensively employed by Mr. Lister and his school, the theory being that putrefaction and pyæmia depend upon the presence of innumerable germs from which these substances free the air.

The principal are carbolic acid, zinc chloride, boracic acid, salicylic acid, sulphurous acid, corrosive sublimate, and perchloride of iron.

The term *parasiticide* has also been employed as indicating those substances which specially act as poisons to the minuter animal or vegetable life, and are used medicinally with this view. Thus sulphurous acid and perchloride of mercury are used with success as local applications in various forms of parasitic skin disease, and sulphurous acid is beneficial in those classes of vomiting which depend on the irritation of low forms of cryptogamic vegetation imbedded in the mucous glands of the stomach.

COUNTER-IRRITANTS.

The theory of the action of epispastics and rubefacients has given rise to much interesting physiological speculation, but we are not yet able to lay down, with absolute precision, the laws on which the beneficial action of these remedial agents depends. We know this much, however, that blisters may occasionally act locally on deeper seated parts, as we are told that redness and inflammation of pleura and peritoneum may be produced by the vesicating influence of cantharides applied to the cutaneous surface superficial to these structures.

Then, again, vascular connection may explain other phenomena, and more especially may this be traced in the

chest between the pericardial vessels and those of the skin immediately over the heart, and in the lumbar region between the superficial vascular supply and that which furnishes to the kidneys their due allowance of arterial blood.

These more direct and obvious explanations of various interesting therapeutical phenomena do not, however, lead us very far, and we are compelled to fall back upon much more abstruse considerations. Into these neither our space nor the scope of the present volume will permit us to enter very far, and we only very briefly draw a slight outline of those branches of the question which seem to have reached something of vigorous growth.

Now for the relief of pain, counter-irritation may act, 1st, by removing or modifying the structural condition on which the reflected suffering depends, as we often cure a facial neuralgia by extracting a carious tooth; or 2nd, the end organs of the sensory nerves may be modified in molecular arrangement; or 3rd, the trunks of the nerves themselves, or the nuclei or the nervous centres, may be altered in some unexplained way by the stimulus applied to the seat of pain.

For other purposes, also, counter-irritation may act by altering or redistributing blood supply, as by actually emptying the deeper vessels and filling the more superficial arterioles at their expense; or special function or nutrition may be profoundly affected by influencing the trophic or other nerves which more especially preside over these departments of physiology.

The practical applications of counter-irritation in the treatment of disease are both numerous and interesting; but when considering iodine, mustard, and cantharides, we have already devoted some space to the consideration of the principles which should guide us to their successful use.

DIAPHORETICS.

This class of remedies has the property of increasing the secretions of the skin, and is usually divided into (1) the stimulating and (2) Diaphoretics are used freely in practice at the outset of acute diseases, to relax the contracted vessels and relieve the hot dry skin, and

the sedative. Under the first heading we include those drugs which stimulate the cutaneous circulation, among the principal of which are ammonia, alcohol, the cold bath, phosphorus, &c. ; and, secondly, we speak of the sedative class, which act by dilating the superficial vessels, these being ipecacuanha, tartar emetic, jaborandi, aconite, the warm bath, and all the nauseating and emetic substances, the depressing action of which is invariably attended by free perspiration. Then again we must refer to what are known as adjuvant remedies, such as warmth to the surface, diluent drinks, &c.

in pneumonia this line of treatment has produced good results. The sedative class would seem to be best adapted for this purpose ; but the cold bath, which more naturally belongs to No. 1, has been freely used abroad in febrile disorders, and part of its beneficial effects must no doubt be due to its action on the skin.

In eruptive fevers, when the eruption is not sufficiently developed, we endeavor to excite the function of the skin, and thus favor the local manifestation of the poison, by warm baths, cold packing, and possibly by phosphorus. We also use diaphoretics to favor absorption, as in various dropsies, and to relieve the kidneys, between which and the skin so much sympathy exists.

They are also of service by assisting to eliminate morbid products from the blood. When the various internal organs, whose duty it is to get rid of certain effete and hurtful matters, are temporarily or permanently off work, we may hope to supply their place in some measure by the skin, and in Bright's disease we may thus relieve the system of some urea, in jaundice of biliary products, &c.

DIURETICS.

Diuretics stimulate and increase the flow of watery fluid through the kidneys in various ways, which we may conveniently classify under the following headings :—

Class 1. Stimulating diuretics, which act by directly exciting or irritating the glandular secreting structures of the kidney.

1. These are cantharides, turpentine, colchicum, &c., and they are rarely used, as they are liable to produce pain, strangury, and even hæmorrhage. Cantharides has, however, been recommended in some forms of chronic albuminuria and in pyelitis.

Class 2. Those drugs which stimulate the circulation, causing increased arterial tension, and thus greater pressure on the walls of the Malpighian bodies, by which means transudation of watery fluid is mechanically favored.

2. The principal of these are digitalis, belladonna, squill, and ergot ; and they are of service in various dropsies, and perhaps most especially in those which depend on disease of the heart.

Class 3. We next come to the saline diuretics, which, in addition to some slightly stimulating influence, have a special power of absorbing and holding watery fluids, which they then carry with them in their exit from the body.

3. In this group we include the lithia, potash, and soda salts, and most of them possess a double action, being diuretic in small, and purgative in large doses. They are also used with advantage in anasarca and dropsical accumulations.

Class 4. Mechanical diuretics must next be included in the list, and among the principal of these we may mention water, which acts by washing the urinary tubules clear from epithelial casts, which block them under certain conditions.

4. Dr. Dickinson has shown how well copious draughts of water act in the acute desquamative nephritis of children, on the mere mechanical principle of sluicing or washing out the obstructed tubules. The indirect diuretics are often

tions, and so allowing secretion to be re-established. Under this heading we may also group those remedial means which act indirectly by relieving the kidneys in various ways. Thus, when congestion is present, local bleeding, dry cupping, warm fomentation, &c., may be the best diuretics. When the kidneys are pressed upon by ascitic fluid, a renewal of their full function frequently follows the operation of tapping, and in many cases we may give these organs temporary rest by handing some part of their duties over to the skin or the bowels.

of most service in renal disease.

Diuretics are notoriously uncertain remedies, and many of them have not the slightest power of increasing the flow of urinary water during health. They also vary much in their power of promoting the elimination of urea and other products of excretion by the kidneys. They may be given either by the mouth or by vapor, in which way oil of juniper acts well; or, as in the case of digitalis, they may be efficiently used by cutaneous absorption. In their administration we must observe the following rules. Give them freely diluted, and, as a rule, combined with one another, as several remedies of the class seem to act better than one, as in the famous Guy's pill. Keep the patient cool, so as to avoid any action on the skin, and endeavor to prevent the bowels from coming too freely into play.

EMETICS.

The object of an emetic is to stimulate the so-called vomiting centre in the medulla oblongata, close to the origin of the pneumogastric nerve, and induce it to call forth the complicated series of muscular acts which termi-

nates in evacuation of the stomach. Emetics act in two ways, and are thus classed, as :

Direct.

Where the drug irritates the filaments of the pneumogastric nerve distributed to the mucous membrane of the stomach, and this irritation, being transmitted to the centre, is reflected in motor impulses through the pneumogastric, phrenic, and intercostal nerves. The direct emetics are prompt in their action, and cause little nausea and depression ; and the principal members are sulphate of zinc, sulphate of copper, carbonate of ammonia, mustard, common salt, &c.

Indirect.

Emetics of this class are conveyed directly by the medium of the blood to the vomiting centre, and act well by injection without coming into contact with the stomach. They are less prompt and more depressing than those of the other class. Principal members: Ipecacuanha, tartarized antimony, apomorphia, veratria, delphinia, &c.

The reflex chain then being established by which the muscular apparatus causes vomiting, we must next consider the various steps of the process.

Physiology of Vomiting.

1. In the first place the cardiac sphincter must be relaxed, or no vomiting can take place, and the persistent contraction of this structure may account for many cases of distressing retching.

2. The actual contraction of the walls of the stomach itself must be supplemented by that of the abdominal parietes.

3. The diaphragm descends and becomes fixed.

Therapeutics.

Emetics are used to empty the stomach in cases of poisoning, and here we invariably employ the direct class, such as sulphate of zinc, mustard, salt, &c.

They are also of service in some forms of dyspepsia and to clear the stomach in intoxication, and for the relief of the convulsions of infancy, which often depend on irritating articles of diet.

4. The glottis is closed, so that the various muscles compressing the stomach act between two fixed points.

5. As vomiting cannot be effectually accomplished if the stomach is quite empty, under these circumstances the patient generally swallows a certain quantity of air, so as to distend the viscus.

[Where the direct emetics are contra-indicated, we may resort to the indirect, which act by absorption. Emetia and apomorphia will cause vomiting if injected hypodermically.]

1. *Action on the Brain and Nervous System.*—Emetics may cause some congestion of the brain by the obstructed venous return from the neck during the act of vomiting.

2. *Circulation and Respiration.*—They have a sedative action on the heart.

As the respiratory is close to the vomiting centre, the breathing generally becomes sighing and irregular during the act of vomiting; but in addition to this there is an increase of secretion from the pulmonary mucous membrane, and the compression of the lungs forces retained mucus out of the bronchial tubes.

3. *Organs of Secretion.*—By the pressure exerted on the intestines, some slight purgative action may result, and prolonged vomiting always leads to the discharge of bile from the stomach by the mechanical squeezing of the liver and gall-bladder.

1. We must therefore avoid their use in apoplectic cases.

2. Emetics are of great service in clearing the lungs in bronchitis, and in getting rid of the false membrane in croup and diphtheria, and they may thus be said to act as expectorants. We had here best use such emetics as ipecacuanha and tartarised antimony, which combine an expectorant action.

3. Emetics may therefore be said to act as cholagogues, and may be of great service in stimulating the action of the liver, and removing inspissated secretions from the gall-bladder. Some authorities hold that it is good practice to give an

4. *Cutaneous*.—Emetics invariably cause free perspiration during their action, as well as an increased flow of saliva.

emetic as early as possible at the outset of fevers, such as enteric; and it has been suggested that the fever poison is retained at this stage in the bile, and may be expelled along with it from the system.

EMMENAGOGUES AND ECBOLICS.

Of these we may consider, first,

ECBOLICS.

Physiological Action.

Ecbolics are substances which cause such violent contraction of the pregnant uterus as to effect the expulsion of its contents. It is not quite certain whether the principal members of the group act specially on the muscular structures of the organ, or whether a primary intervention of nervous influence through the spinal cord is necessary.

Therapeutical Action.

Ecbolics are used extensively in obstetric practice when it becomes necessary to stimulate the flagging powers of an exhausted uterus—the principal being ergot, digitalis, savin, borax, quinine. We are also compelled, under certain circumstances, to have recourse to the induction of premature labor, as when dangerous sickness goes on unchecked, or when weakened abdominal or thoracic viscera are injuriously compressed by the pregnant uterus. In such cases, however, it is generally found best to use mechanical means.

EMMENAGOGUES

May be direct or indirect.

Physiological Action.

Direct emmenagogues act merely by restoring the normal functions of the uterus when these are suspended.

Indirect emmenagogues act by removing some constitutional condition which interferes with the due performance of the uterine functions. Thus amenorrhœa very frequently depends on anæmia, or constipation may require removal before our more special remedies will act.

Therapeutical Action.

Most of the ecbohic drugs act as emmenagogues when given in small doses to a non-pregnant patient, and to the list we may add rue and castor. Of all these, however, ergot is by far the most effectual.

The different preparations of iron, in combination with aloetic or other purgatives, act well, and we may aid our chances of success by all hygienic means, as well as by warm hip-baths, leeches, and mustard stupes, at the normal menstrual periods.

EXPECTORANTS.

These are remedies which facilitate in various ways the expulsion of secretion from the bronchial tubes. They may thus be divided :—

1. The emetic class, which are the most efficient of all, removing and softening the mucus, causing the transudation of watery fluids, and relaxing the muscular walls of the bronchial tubes.

2. Nauseants may also be of service as expectorants.

3. We then have what are called the stimulating expectorants, acting either on the general vascular system,

1. There can be no doubt that, when the lungs are choked with secretion, a good emetic often acts like a charm, as in bronchitis, whooping-cough, &c.

We must here use the indirect emetic agents, as am. carb., ipecacuanha, &c.

2. These are merely the indirect emetic drugs given in small doses, as antimony, ipecacuanha, &c.

3. These are senega, am. carb., &c.; but it is evident that any tonic or stimulating remedy may frequently act

or specially on the nervous and muscular structures of the lungs.

4. Those remedies which promote secretion from a dry and swollen mucous membrane.

5. Expectoration is often rendered difficult by tenacity of the mucus, which is coughed up, only after much straining and effort, and great relief follows every drug which can thin or liquefy the secretion.

6. Spasmodic contraction of the smaller bronchial tubes may interfere with free expectoration.

indirectly as an expectorant, by improving the tone of the circulation and giving the patient strength to cough and clear his lungs. The stimulating expectorants are more especially used in the later stages of pulmonary disease.

4. In the earlier stages of bronchitis much discomfort occurs from the dry hard cough and difficulty of breathing arising from swelling of the bronchial mucous lining. Great relief is experienced when free expectoration is established, and this may be promoted by inhalation of steam, liq. ammonii acet., lobelia, and the class of nauseants generally.

5. We find that alkalies act well here, and, if any gouty tendency exists, more especially potassic iodide.

6. Here we may hope to obtain relief by the use of opium, belladonna, stramonium, tobacco, &c.

PURGATIVES.

Purgatives may be divided, first, into two classes depending on their origin, and these are:—

1. The inorganic substances, comprising chiefly the mercurials and salines.

2. Those derived from the vegetable kingdom, and which depend for their therapeutical action on the presence of resins or oils.

Their actual modes of operation, however, are much more varied, and they will best be considered by division under various headings, according to their physiological and therapeutical properties.

1. *Laxatives*.—These substances act by causing a slight increase in the peristaltic movements of the intestines, with softening of the fæces, which are then expelled in a solid and formed condition.

1. The principal of these are sulphur, castor-oil, magnesia, &c.; but in addition to actual drugs we may include various articles of diet, as oatmeal, brown bread, whole flour, figs, prunes, &c., which act purely mechanically.

Laxatives are useful whenever we desire a mild and unirritating effect, as in simple constipation from dyspepsia, pregnancy, convalescence from acute diseases, sedentary habit, and other causes.

Castor-oil acts well in the early stages of diarrhoea, by sweeping away the irritating cause.

2. *Purgatives* produce more decided effects both in stimulating movement and secretion; but it is difficult to separate them entirely from either class, No. 1 or No. 3.

2. Rhubarb, senna, aloes, and jalap, are reckoned among the chief of these, and they are used in various dyspeptic conditions, rhubarb being more especially stomachic, and aloes emmenagogue in their properties.

3. *Drastic Purgatives*.—These run by insensible gradations into the preceding class. Their action depends on an irritation of the mucous membrane of the intestines, and not only an actual increase of secretion from their glands, but the

3. In this class we include jalap, scammony, colocynth, gamboge, and croton oil, and they are principally used either in obstinate constipation, or to produce a derivative or species of counter-irritant effect in various forms of brain disease.

withdrawal of watery fluids from the blood. An overdose, therefore, may be attended by serious depression, discomfort, and even by death from inflammation of the bowel.

4. *Hydragogue purgatives* cause very free secretion from the mucous membrane of the bowels, and empty the veins by withdrawing fluids from the blood.

5. *Saline Purgatives*.—We have already, when treating of sulphate of magnesia, considered the action of this class, and have pointed out how, from their low diffusive power, they pass with difficulty into the blood, and how, whilst in the intestine, they not only absorb, retain, and carry away the watery fluids which they find in the intestine, but also directly withdraw fresh supplies from the blood itself.

6. *Cholagogue Purgatives*.—Much experiment has recently been expended on the action of this class, and those recently conducted on improved principles by Prof. Rutherford have given us very precise and reliable indications for practice. Cholagogues act either by directly stimulating the secretion of the bile,

4. These are elaterium, cream of tartar, &c., and they are most useful in ascites and other dropsical conditions, and for the relief of a feeble and laboring heart by diminishing the actual volume of the blood.

5. Sulphate of magnesia and many of the salts of potash and soda must here be included. They are best given in a state of free dilution, and form very efficient habitual purgatives, more especially in the form of various natural purgative waters, such as Friedrichshall, and Pullna. [Hunjâdi Janos, Congress Water, &c.]

6. The principal members of this group are mercury, podophyllin, rhubarb, aloes, jalap, etc. They are used for the relief of various functional affections of the liver, to remove what is commonly known as 'biliousness,' and to obviate portal congestion.

or by contracting the gall-bladder and irritating the duodenum, so as to sweep the bile out of the intestine as fast as it is poured in by the hepatic ducts.

In addition to drugs belonging to the actual purgative class, we have many indirect remedies which act with considerable efficiency. Thus we may use enemata, cold to the abdomen, mechanical kneading of the parietes, electricity; we may stimulate the muscular tissues to contraction; or we may cause a purgative action by relieving spasm.

Among the stimulating class we may mention strychnia, nux vomica, ergot, sulphate of iron, etc., and these are very efficient, in combination with mild purgatives, where constipation depends on a lax or weakened state of the intestinal walls.

When spasm or irregular contraction prevents free action of the bowels, we must have recourse to opium, belladonna, or acetate of lead, which, under these conditions, may be looked upon as true cathartics.

In administering purgatives, we must consider the various parts of the intestinal canal on which they act. Thus senna, jalap, &c., act on the small intestine, aloes on the large, podophyllin on the duodenum, &c. We must also consider the time of their administration, as we find that the slowly acting resinoid substances are best given at night or before dinner, whereas the salines are best taken on an empty stomach, and more especially before breakfast. The mode of administration is also worthy of note, the resinoids being best taken in the form of pill, whereas the salines act best in solution with free dilution and in combination with bitters, iron, or sulphuric acid.



REMEDIES

COMPRISED IN THE

PRIMARY LIST OF THE UNITED STATES PHARMACOPŒIA.

ABSINTHIUM—WORMWOOD.

[*The tops and leaves of Artemisia Absinthium, U. S.*]

Wormwood was formerly used as a bitter tonic and anthelmintic, but it has now quite disappeared from practice. Its prolonged use as a beverage, in the form of liquor, has been shown to produce a condition of enfeeblement and irritability of the nervous system, with a tendency to epileptiform convulsions.

[In combination with other herbs, it is sometimes used in domestic practice under the name of German Tea. Wormwood entered into the composition of the once famous "thieves' vinegar," *Vinaigre des quatre voleurs* (*Nysten. Dict. de Méd.*). The plant contains a volatile oil, which gives name and flavor to *absinthe*, a highly-pernicious but popular drink in France.]

ACACIA—GUM ARABIC.

[*A gummy exudation from Acacia vera and other species of Acacia, U. S.*]

OFFICINAL PREPARATIONS, U. S.

Syrupus Acaciæ, used as a vehicle.

Mucilago Acaciæ, used as a vehicle.

Also enters into *Mistura Amygdalæ*, *Mistura Cretæ*, and *Mistura Glycyrrhizæ Compositæ*,¹ and is used as an excipient and dusting-powder for pills.]

¹ [Commonly called Brown Mixture.]

Gum is demulcent, and in the form of mucilage is much used for the suspension of bulky and insoluble powders, as well as to prevent the precipitation of the resin, which ensues when such substances as tincture of myrrh, tinct. cannabis Indicæ, &c., are added to water.

[Gum-Arabic water may be given as a demulcent drink in *fevers*, in *angina*, in *gastro-enteric inflammation*, and *dysentery*. It has some slight nutritive properties.]

[ACETUM—VINEGAR.

Impure dilute acetic acid prepared by fermentation, U. S.

OFFICIAL PREPARATIONS, U. S.

Acetum Destillatum, used in making Tinctura Opii Acetata.

EXTERNAL AND INTERNAL USES.

Vinegar, more or less diluted, is a favorite domestic application in *headache*, *sprains* or *bruises*, and *sun-burn*; it is also used as a clyster against *ascarides*. It may be given as a refrigerant drink in *fevers*; and in these cases it is frequently applied to the surface of the body, with a sponge, as a means of reducing high temperature. In small amounts vinegar aids digestion, but in excess produces degeneration of the gastric tubules and thickening of the coats of the stomach. It is supposed to act on the blood by influencing its crasis, and reducing the proportion of fibrin. It has been found an efficient remedy in *scurvy*, in combination with nitre (℥j. to Oj.), of which an ounce may be given four times daily.]

ACIDUM ACETICUM—ACETIC ACID.

[Acetic acid of specific gravity 1.047, U. S.]

OFFICIAL PREPARATIONS, U. S.

Acidum Aceticum Dilutum. (f℥ij. in Oj.) Dose f℥j.—ij.

Also enters into Acetum Lobeliæ,¹ Acetum Opii,¹ Acetum Sanguinariæ,¹ Acetum Scillæ¹ (Syrupus Scillæ), Emplastrum

¹ [These four, with Acetum Destillatum, comprise the class of Vinegars, or **Aceta**, of the Pharmacopœia.]

Ammoniæ, Extractum Colchici Aceticum, Extractum Ergotæ Fluidum, Liquor Ammonii Acetatis, Syrupus Allii, Potassii Acetas, and Zinci Acetas.

ANTIDOTES.

In poisoning by acetic acid, alkalies or their carbonates may be given, properly diluted, and vomiting encouraged by large draughts of warm water containing soap.]

EXTERNAL ACTION.

Strong, or glacial acetic acid, is a favorite and very successful application to *warty growths*, whether of venereal origin or not. The little tumor is touched several times with a glass rod, or brush, or a piece of wood dipped in the acid, care being taken that none of the fluid trickles down over the neighboring structures. A few repetitions of this process will generally prove effectual. It is also topically used in some obstinate forms of *skin disease*, and more especially the varieties of *tinea* comprised under the term *ringworm*. The acid probably acts by directly attacking and destroying the parasitic growth on which the troublesome affections depend. Acetic acid is also occasionally applied to *corns*.

Another mode of local use was proposed by Dr. Broadbent some years ago, and strong hopes were then entertained that a remedy had been at last found for *cancer*. Observing the destructive influence of the acid on cancer elements out of the body, Dr. Broadbent very reasonably expected that a similar effect might be produced within the living organism, and advised the injection of diluted acetic acid into the substance of the cancerous mass. Some evidence seemed to be adduced in its favor, but its action being painful, tedious, and uncertain, the process has now fallen into perhaps unmerited oblivion.

INTERNAL USE.

Acetic acid is seldom used internally, although it forms an agreeable and effectual remedy for the checking of *night sweats*, and Graves used thus to prescribe it.

The varieties of acetic acid are: Acidum aceticum, from which are prepared acidum aceticum dilutum and oxymel,

the doses being of acid. acet. dil. f℥j. to f℥ij., oxymel [Br.] f℥j. to f℥ij.; and acidum aceticum glaciale. Then we have vinegar, the strength of which corresponds pretty accurately with the dilute acid, and which is purely a domestic remedy for headache, hysteria, and other allied conditions.

ACIDUM ARSENIOSUM—ARSENIOUS ACID.

[*Sublimed arsenious acid in masses, U. S. See ARSENIC.*]

[ACIDUM CARBOLICUM IMPURUM.

Impure carbolic acid, U. S. Used only as an external remedy or for disinfecting purposes.]

ACIDUM CARBOLICUM—CARBOLIC ACID.

[*A solid substance obtained from the products of the distillation of coal-tar, between the temperatures of 300° and 400°, U. S.*]

Dose, gtt. i.-ij., in pill or solution.

OFFICIAL PREPARATIONS, U. S.

Glyceritum Acidi Carbolici. Dose ℥x.-xl.

Unguentum Acidi Carbolici (℥j. to ℥j.).

ANTIDOTES.

There are no direct antidotes to poisoning by carbolic acid. Alkalies, soap, or the fixed oils may be given, with demulcent drinks, and the stomach evacuated with a pump or syphon, as the local effect of the acid will generally prevent emetics from acting.]

LOCAL ACTION.

Physiological Effects.

Carbolic acid is, in the first place, an antiseptic, from its power of destroying the minuter forms of animal and vegetable life.

Therapeutical.

It is therefore much used as an antiseptic and deodorant for the treatment of ill-smelling drains, etc., or to destroy the infectious properties of various secretions or discharges from the sick. It may also be useful as a lotion or injection to foul sores.

Carbolic acid is an irritating substance, and, if applied sufficiently long to the skin, will cause sloughing.

It has, however, undoubted anæsthetic properties.

It is also readily absorbed through the skin.

Although carbolic acid may be of use in correcting fœtor, it is too irritating to make a good lotion for wounds or ulcers, [unless properly diluted, with oil (1 in 24) or water (3j. to Oj.), when it forms an admirable dressing.] It has been used as a caustic in some ulcerative affections, as *lupus*. It has been recommended as a local anæsthetic during small operations, and to deaden the pain of some caustic applications. [The pain of opening a *felon* may be greatly reduced by previously immersing the finger for a few minutes in a 3 to 5 per cent. solution of carbolic acid.]

We must therefore remember that symptoms of poisoning may readily be produced by the application of carbolic acid over any considerable cutaneous area.

ANTISEPTIC SYSTEM OF PROF. LISTER.

Its principal application, however, in surgery, is in enabling us to carry out the far-famed antiseptic system of Prof. Lister.

This eminent surgeon, adopting the views of Pasteur, and believing that suppuration, pyæmia, and various other inconveniences connected with open wounds, arise from the

irritation of minute germs contained in the air, has devised a process in which the atmospheric air, before reaching the raw surface, is filtered through carbolic acid and thus deprived of its irritating properties.

The acid itself, being extremely irritating, is prevented from coming in contact with the wound or sore by a protection of oiled silk, over which are superposed several layers of gauze impregnated with paraffin 16 parts, resin 4 parts, and carbolic acid 1 part; and this dressing need not necessarily be changed oftener than every two or three days.

Mr. Lister prevents the access of air during operations by surrounding the part with an antiseptic atmosphere, composed of a sprayed watery solution of carbolic acid of 1 to 40, and the instruments and fingers of the surgeon are carefully washed with carbolized oil, whilst the arteries are tied with carbolized cat-gut ligatures, cut off short. By adopting these precautions, and attending most rigorously to the careful dressing of wounds, he has obtained excellent results, not only after ordinary operations, but in chronic abscesses wherever

situated, compound fractures, and various diseased conditions connected with joints, whose cavities he is enabled to open and explore with perfect safety.

INTERNAL ACTION.

Carbolic acid, if administered in sufficient quantity, is very poisonous in its operation, causing failure of the heart's action, spinal convulsions, gastro-intestinal irritation, and lowered temperature. Its antiseptic properties sufficiently explain its internal use.

Carbolic acid has occasionally caused death by being accidentally drunk in mistake for beer, or by being incautiously applied to the skin. The best antidotes are olive oil and saccharated lime.

It is occasionally given internally to counteract *flatulence* and *sarcinous vomiting*; but the sulphocarbolates, and more especially that of soda, are the most convenient forms for its administration in doses of 15 to 30 grains. [Carbolic acid has been recommended for *tenia*, in pill-form, taking three to five grains in the course of the day.]

ABSORPTION AND MODE OF ELIMINATION.

Carbolic acid is rapidly absorbed, and quickly and entirely given off by the urine, to which it imparts a peculiar greenish-black hue and its own peculiar smell.

[ACIDUM CHROMICUM—CHROMIC ACID.]

NO OFFICIAL PREPARATIONS, U. S.

EFFECTS AND USES.

Chromic acid is an escharotic and antiseptic; it rapidly oxidizes organic matter and is the most energetic disinfectant

known. A strong solution (gr. c. to f℥j.) may be applied with a glass rod, to destroy *warts*, *condylomata*, and *excrescences*, or to reduce *enlarged tonsils*. Greatly diluted (gr. ss. to f℥j.) it forms a detergent wash for *mercurial stomatitis*, *scurvy*, *diphtheria*, *œdema of the glottis*, *ulcers*, and *phagedæna*. On account of the difficulty of limiting its effect it should not be applied in substance, as when used in this manner to destroy warts on the fingers it has been known to eat into the joint and require amputation of a phalanx.]

[ACIDUM CITRICUM—CITRIC ACID.

OFFICIAL PREPARATIONS, U. S.

Liquor Ferri Citratis, Liquor Magnesiae Citratis, Liquor Potassii Citratis, Lithii Citras, Potassii Citras, Syrupus Acidi Citrici, and in preparing Ferri Pyrophosphas.

Dose, gr. xx.—xxx.

EFFECTS AND USES.

As a refrigerant in fevers, citric acid solution is used in the form of lemonade, neutral mixture (*mistura potassii citratis*), or the citrates. It has been used in *scurvy*, *liver disease*, and *rheumatism*, and as an application to the throat in *diphtheria* (gr. viiss. to f℥j.). Dr. H. Bence Jones believes that lemon juice and citric acid increase the acidity of the urine; they consequently are contra-indicated in *lithuria*, and should not be given for a length of time, continuously, in the gouty diathesis.]

EXTERNAL USE.

Citric acid was proposed a few years ago as a soothing local application to cancerous sores.

INTERNAL USE.

Citric acid is used chiefly as a cheap and convenient substitute for lemon juice in effervescing draughts, which are very extensively prescribed on account of their cooling and refreshing properties in feverish conditions, and for the soothing influence of their carbonic acid when the stomach is irritable.

Whenever lemon juice can be procured, it should be used in preference; but at periods of the year when this

fruit is out of season, citric acid will act well, and we here give a table from Squire, showing the proportions in which the acid and alkali should be prescribed to insure exact saturation.

17 grs. of citric acid, or half a fluid ounce of fresh lemon juice	} will neutralize	{ 25 grs. bicarbonate of potash. 20 " carbonate of potash. 20 " bicarbonate of soda. 35 " carbonate of soda. 15 " carbonate of ammonia. 13 " carbonate of magnesia.
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Acidum tartaricum, being cheaper than citric acid, is often used to construct effervescing draughts.

ACIDUM HYDROCYANICUM DILUTUM— DILUTE HYDROCYANIC ACID.

[A two per cent. solution of Hydrocyanic acid in water.

ANTIDOTES.

Chlorine or ammonia may be cautiously administered, accompanied by cold affusions to the spine, and artificial respiration. As a chemical antidote, sulphate of iron (gr. x.), and tincture of the chloride of iron (fʒj.), dissolved in a fluid ounce of water, may be given immediately, to be followed by twenty grains of carbonate of potassium, likewise in solution, forming with the poison insoluble *Prussian blue*.]

EXTERNAL ACTION.

Physiological.

Prussic acid, applied to the skin in a concentrated form, may cause at first slight irritation, but secondarily diminishes its sensibility, acting in some degree as an anæsthetic, probably from a benumbing influence on the extremities of the sensory nerves.

Therapeutical.

It is therefore used externally, largely diluted, to relieve *neuralgic* pain and allay itching, more especially in skin disease. We may thus hope to alleviate the tormenting irritation often attending *prurigo* and *eczema*; but we must be careful never to let the lotion come in contact with any abrasion on the surface, as prussic acid is very readily and rapidly absorbed.

INTERNAL ACTION.

Hydrocyanic acid, being the most powerful and speedy poison with which we are acquainted, requires to be prescribed with very great caution.

Physiological.

1. *On the Nervous System.*
—Prussic acid has some effect on the brain, causing giddiness and slight stupor; the respiratory centre in the medulla next becomes weakened, and the motor nerves are more or less paralyzed, causing excessive muscular feebleness.

2. The *respiration* becomes slow and irregular, and finally ceases, death in cases of poisoning being generally due to suffocation. The sensory nerves are also enfeebled in their conducting power.

3. Prussic acid has a powerful sedative action on the *heart*, the circulation becoming slow, feeble, and irregular under the influence of poisonous doses; and this arises both from an influence on the nerves and on the

Therapeutical.

1. It is used with great benefit in those forms of dyspepsia attended with epigastric pain and vomiting following food, and whether depending on gastric ulcer or on mere irritation of the mucous membrane. It has also been given in *whooping-cough*; but in my experience its action is here very uncertain, and I have been unable to satisfy myself that it is a remedy of much value. In some forms of chronic and spasmodic cough it does good, but it is essentially in *dyspepsia* that we obtain real advantage from its use.

3. It has been successfully employed in nervous palpitation [or irritable heart].

muscular structures of the heart itself.

It also acts directly on the blood, combining with the hæmoglobin of the red corpuscles, and preventing them from properly fulfilling their duty of carrying oxygen to the tissues.

4. Prussic acid has no special influence on the *temperature* or on *secretion*, save that the saliva is generally increased in quantity.

Prussic acid is very rapidly eliminated from the system, probably by the breath, and half an hour may be sufficient for this purpose, so that in a case of poisoning we may have good hopes of recovery, if we can sustain the powers of life during this period.

Poisonous Effects.—In a large dose prussic acid kills immediately, the victim frequently uttering a loud cry, and expiring from cardiac syncope. If the quantity taken be smaller, symptoms of suffocation supervene from paralysis of the respiratory centre, and, if the process of poisoning be more gradual, from deficient supply of oxygen in the blood; other symptoms noted being convulsions, great muscular prostration, dilatation of pupils, and quick, feeble, irregular pulse. In fatal cases, *post-mortem* examination shows nothing characteristic.

If the poison be taken in

Antidotes.—Considering the great rapidity of the action of hydrocyanic acid, it is comparatively seldom that we have any opportunity of employing antidotes; but supposing we see a case sufficiently early to do so, we should have vigorous recourse to cold affusion and the inhalation of ammonia and chlorine water. Artificial respiration should be then steadily persisted in, and if we can thus counteract the tendency to death by suffocation, and tide the patient over the first half-hour, we may look forward to success, never despairing as long as the faintest pulsation can be felt in the heart.

a concentrated form, death may ensue very rapidly, in less probably than a minute; and Preyer, who has devoted special attention to the subject, has observed a guinea-pig to be apparently dead one second after inhaling some gaseous acid, all efforts at breathing having finally ceased in fifteen seconds. He, therefore, considers this to be the most deadly mode of its administration; but no matter through which channel it enters the body, it speedily kills any animal, and, curiously enough, it is equally destructive to plants.

Secondary auxiliary means exist in the internal administration of ammonia, of chlorine water, or of carbonate of potash, followed by the mixed sulphates of iron, which convert the poison into prussian blue; and recently the subcutaneous injection of atropia has been proposed as the true physiological antidote.

DOSE AND MODE OF ADMINISTRATION.

One grain of anhydrous acid has caused death, and of this the preparation used in medicine contains 2 per cent., the old Scheele's, which is now obsolete, having contained 4 per cent.

In consideration of the rapid way in which the acid is thrown out of the system, we must repeat the dose frequently, from every hour to every three hours; and it is well not to order too large a quantity at one time, not because the acid tends to float on the top, as was formerly supposed, but because there is always a chance of an overdose being given through ignorance or carelessness. We may safely prescribe from 2 to 6 minims [beginning always with gtt. j.], suspending it if the patient complains of any constriction about the throat. For external use ℥ij. may be dissolved in 8 ounces of water or rose water.

R. Acidi hydrocyanici diluti	℥ij.;
Glycerini	℥j.;
Aquæ rosæ	ad ℥viiij.
Misce, fiat lotio.	

In a case of troublesome itching.

R. Acidi hydrocyanici diluti ℥xij. ;
 Misturæ amygdalæ fʒvj.
 Misce, fiat mistura. Capiat cochlearia duo magna tussi
 admodum ingravescente.

For a case of irritable cough.

R. Acidi hydrocyanici dil. ℥xxv. ;
 Bismuthi subnitratis ʒss. ;
 Syrupi aurantii fʒj. ;
 Gentianæ infusi ad fʒviiij.
 Capiat cochlearia magna ter in die ante cibum.

In a case of irritative dyspepsia.

Or, a few drops of prussic acid may be added to the ordinary effervescing draught with good effect.

[ACIDUM LACTICUM—LACTIC ACID.

OFFICINAL PREPARATION, U. S.

Ferri Lactas. Dose gr. v.

A syrupy, nearly transparent liquid, with slight odor and a very sour taste, obtained from sour milk. It exists normally in the gastric juice, and hence is a useful addition to preparations of pepsin. It has been given in *dyspepsia* (fʒj. s. t. d.) in sweetened water at meal-time. Locally it has been employed (diluted four-fifths) as an application to the false membrane in *croup* and *diphtheria*.

According to Prout, *rheumatism* is connected with an excess of lactic acid in the blood ; and this fact accounts for the benefit derived from the alkaline treatment.]

ACIDUM NITRICUM—NITRIC ACID.

[*Nitric acid of the specific gravity 1.420, U. S.*

OFFICINAL PREPARATIONS, U. S.

Acidum Nitricum Dilutum (fʒiij. to Oj.). Dose, ℥v.—xxx.

Also enters into Acidum Nitro-muriaticum, Argenti Nitras, Bismuthi Subnitratis, Liquor Ferri Nitratis, Liquor Hydrargyri Nitratis, Spiritus Ætheris Nitrosi, Unguentum Hydrargyri Nitratis, and in the preparation of Acidum Phosphoricum Dilutum, Antimonii Oxidum, Bismuthi Subcarbonas, Cadmii Sulphas, Hydrargyri Oxidum Ru.

brum, Liquor Ferri Chloridi, Liquor Ferri Subsulphatis, Liquor Ferri Tersulphatis, Liquor Zinci Chloridi, and Pyroxylon.

ANTIDOTES.

The same treatment as indicated for poisoning by Muriatic Acid and the other mineral acids. Nitric acid stains the skin *yellow*.]

EXTERNAL USE.

Nitric acid is undoubtedly the best form of local application in all forms of sloughing or phagedænic ulceration, whether of venereal origin or otherwise. In these rapidly destructive forms of disease, we shall do well to place our patient under the influence of an anæsthetic, and then apply the strong acid freely and thoroughly to all parts of the affected surface, and we shall thus often succeed in arresting a process which would otherwise go on to severe and even fatal disorganisation.

It is also used locally in the treatment of *piles*, more especially those flat irritable forms of tumour which do not come readily within the reach of the clamp or ligature.

In the proportion of 10 or 20 minims to an ounce, nitric acid forms a good astringent lotion in cases of indolent or unhealthy sores; and it has been recommended by Dr. Roberts, of Manchester, as an injection into the bladder for the solution of *phosphatic calculi*.

INTERNAL USE.

Given internally, nitric acid has tonic properties, and, in combination with bark and opium, acts well in cases of foul or sloughing ulceration. Again, in constitutions broken down by syphilis or by chronic hepatic disease, we may very beneficially give our patient from 15 to 20 minims of the dilute acid three times a day, its action on the liver being by some supposed to have somewhat of a specific character.

R. Acidi nitrici diluti	fʒij.;
Tincturæ opii	ʒxl.;
Tincturæ cinchonæ	fʒss.;
Decocti cinchonæ	ad fʒviij.
Misce, capiat fʒj. ter in die.	

In a case of foul or sloughing ulcer.

ACIDUM NITRO-HYDROCHLORICUM.—

[NITRO-MURIATICUM, 3 to 5.

Dose, 5 to 10 minims, well diluted.

Acidum Nitro-Muriaticum Dilutum (f3iv. to Oj.).
Dose ℥x.—xv.]

This is supposed to have some special action on the liver, and is most extensively used in chronic functional affections of that organ. It has also been highly recommended, in the form of bath, in various hepatic disorders in the proportion of 6 fluid ounces to each gallon of water.

℞. Acidi nitro-muriatici diluti	f3ij.;
Succi [extract] taraxaci	f3ss.;
Spiritus chloroformi [Br.]	f3jss.;
Aquæ	ad f3viij.

M. Capiat f3j. ter in die.

In a case of sluggish liver.

[ACIDUM OXALICUM—OXALIC ACID.

OFFICINAL PREPARATION, U. S.

Ferri Oxalis. Dose, gr.ij.—iij.

ANTIDOTES.

Magnesia and lime form insoluble precipitates with oxalic acid, therefore compounds containing chalk or magnesia would constitute chemical antidotes. Tooth-powder, lime-water, oxide and carbonate of magnesia, or “the scrapings of the ceiling with a fire-shovel,” may be given with propriety in cases of poisoning; which are not infrequent, since, owing to the resemblance between oxalic acid and Epsom salts, one may be accidentally substituted for the other.

EFFECTS AND USES.

Oxalic acid has been used, in small doses, internally, in *scurvy* and *phthisis*, but has nothing particular to commend it.]

[ACIDUM TARTARICUM—TARTARIC ACID.

OFFICINAL PREPARATIONS, U. S.

Ferri et Ammonii Tartras. Dose gr.x—xxx.

Pulveres Effervescentes. (Soda powders.)

Pulveres Effervescentes Aperientes. (Seidlitz powders.)

ANTIDOTES.

The alkalies, magnesia, lime, soap, or the alkaline carbonates.

INTERNAL USE.

It has been stated that tartaric acid, in 10–20 grain doses, given thrice daily will render the urine acid. The tartrate of magnesium has been recommended as a cheaper substitute for the citrate, as an aperient, and is considered quite as efficient. In sweetened solution, tartaric acid is sometimes used as a refrigerant drink in fevers. The tartrates are laxative and diuretic.]

[List of **Acida**, or acids, officinal in the U. S. Pharmacopœia :—

Acidum Aceticum	Acidum Nitricum Dilutum
“ “ Dilutum	“ Nitro-Muriaticum Dilutum
“ Arseniosum	“ “
“ Benzoicum	“ Oxalicum
“ Carbolicum	“ Phosphoricum Dilutum
“ “ Impurum	“ “ Glaciale
“ Chromicum	“ Sulphuricum
“ Citricum	“ “ Aromaticum
“ Gallicum	“ “ Dilutum
“ Hydrocyanicum Dilutum	“ Sulphurosum
“ Lacticum	“ Tannicum
“ Muriaticum	“ Tartaricum
“ “ Dilutum	“ Valerianicum.]
“ Nitricum	

ACONITUM—ACONITE.

[**Aconiti Folia**.—The leaves of *Aconitum Napellus*, U. S.

Aconiti Radix.—The root of *Aconitum Napellus*, U. S.

OFFICIAL PREPARATIONS, U. S.

Aconitia (from the root). Not given internally.

Extractum Aconiti (of the leaves). Dose gr. ss.

Emplastrum Aconiti (from the root).

Linimentum Aconiti (from the root).

Tinctura Aconiti Radicis. (℞vj. to Oj.) gtt. j.–v.

(*Fleming's tincture of aconite root contains ℥xss. to Oj.*)

ANTIDOTES.

Finely powdered animal charcoal, tannin, astringent infusions, and hot alcoholic stimulants, are useful. The stomach should be carefully washed out, and subsequent symptoms met *pro re nata*.]

Poisonous Properties.

Aconite may kill either by direct cardiac syncope, or, if the action is less rapid, by respiratory failure. Great muscular weakness is noted, the heart's action becoming feeble and irregular, the face pale, the body bedewed with clammy sweat, the pupils first contracted and then dilated, shortly before death closes the scene. The resemblance of aconite root to horse-radish has afforded several opportunities of studying lamentable cases of accidental poisoning.

Therapeutical.

In poisoning by aconite, we must endeavor to sustain the flagging action of the heart by giving stimulants, and keeping the patient most rigidly in the recumbent posture, as death has occurred from syncope produced by suddenly sitting up in bed. *Digitalis* has been proposed as the physiological antidote, bracing up and restoring the contractility of the heart muscle (Fothergill). [20 minims of tincture of digitalis may be administered hypodermically.]

LOCAL ACTION.

Physiological.

Aconite, locally applied, causes a sensation of tingling, followed by numbness of the skin, from a paralyzing influence, no doubt, on the sensory nerves. It may also bring about some local vasomotor paralysis.

Therapeutical.

Aconite is a most valuable local sedative in painful nervous affections, and more especially in *facial neuralgia*, where the tincture or liniment, applied along the course of the affected nerve, will often allay and even remove suffering.

CONSTITUTIONAL ACTION.

*Physiological.**Therapeutical.*I. *On Nervous System.*—1. *Brain.*—In poisoning by

aconite, the intellectual faculties are usually quite unaffected, but in some cases stupor has been observed.

2. *Spinal Cord*.—Aconite paralyses both the reflex and the motor activity of the cord, as evidenced by almost total loss of power in the muscular system.

The respiratory centre also eventually becomes paralysed, and death may result by suffocation.

3. Although this loss of voluntary movement is supposed to be primarily spinal in origin, it is believed that the motor nerves themselves are secondarily affected, the paralysing influence beginning at their peripheral extremities. The inhibitory cardiac ganglia are first stimulated, and secondly depressed, and a sedative effect is produced on the sensory nerves, the earliest indication of the action of the drug being tingling followed by numbness and anæsthesia of the lips and throat.

Opinions differ as to the influence of aconite on the vaso-motor nerves, and it is not believed by many authorities to have any special operation over this system. Dr. Bagshawe, however, has published some cases of facial sympathetic paralysis, with injection and

3. Aconite is one of our best remedies in *facial neuralgia*, given either alone or in combination with quinine. In *sick headache* also it is of service, and here it will be prescribed along with tincture of Indian hemp.

sweating, following the local application of aconite, and the diaphoretic action, so often noted, must proceed from this cause. Experimental evidence, however, is very conflicting in this, as well as in other points, respecting the physiological actions of aconite.

II. *Circulating Apparatus.* Aconite is essentially a cardiac sedative, slowing the action of the heart at first from inhibitory stimulation, but then causing an increase in the rapidity of the pulsations, with feebleness and irregularity, ending in death by arrest of all movement in diastole. At the same time the arterial pressure falls in very marked degree.

III. *Respiration and Temperature.*—The respiratory movements tend to become slow, finally irregular, and in some cases, and almost universally in the lower animals, death results from cessation of breathing.

The temperature falls decidedly.

IV. *Digestive and Secretory Apparatus.*—Aconite has no special influence on digestion. It increases somewhat the salivary secretion, and augments largely

II. Aconite is an excellent antiphlogistic, cutting short inflammatory processes in their early stages. Thus in *pneumonia*, *pleurisy*, *peritonitis*, *erysipelas*, *rheumatic fever*, and in the short sharp feverish affections of children, it is of signal service, and seems to have a directly curative action. In *coryza* and in *acute tonsillitis*, also, it has been much praised for the way in which it checks the full development of these troublesome affections.

III. Some part of the good effect of aconite in these febrile affections must be due to its power in slowing the breathing and reducing the temperature.

the action of the perspiratory apparatus of the skin, bringing out in some instances an irritable vesicular eruption. The urine is also somewhat increased in quantity. Aconite is therefore an excellent diaphoretic.

ABSORPTION AND MODE OF ELIMINATION.

Aconite is rapidly absorbed, and given out probably by the urine.

CAUTIONS AND MODES OF ADMINISTRATION.

The very poisonous nature of aconite renders caution necessary in its use, and we must prescribe it with great care in old persons, or where any suspicion exists of feebleness of the heart's action. In sound constitutions, however, and more especially in the case of children, we may use it with freedom, often obtaining really extraordinary results.

It is essential to encounter the inflammation at an early stage, before structural changes have set in; and it is important to combine a little stimulant with the drug. In very acute cases, our best practice will be to give the tincture in small and very often repeated doses, carefully watching the effect on the pulse. One drop every ten minutes, half-hour, or hour, will be the best arrangement during the first day, after which every two hours will be a sufficient interval, the thermometer giving us meanwhile reliable information regarding the progress of the inflammatory condition. In *facial neuralgia*, also, we shall obtain the best results by drop doses repeated at very short intervals, and in no case is it well to overstep a maximum dose of 5 minims.

The alkaloid aconitia is occasionally used as a external application [in ointment, containing gr. i.—ij. to the ounce].

[ADEPS—LARD.

The prepared fat of Sus Scrofa, U. S.

Lard is emollient and is sometimes used in frictions, but is chiefly employed in Pharmacy in the preparation of ointments and cerates. In obstetrical or gynæcological

practice, lard is considered to be a universal lubricant, and is rarely absent from the lying-in chamber, where it is also used as a detergent to remove the *vernix caseosa* from the new-born. Washed lard is occasionally employed to prevent the eyelids from adhering in catarrhal conjunctivitis.

List of **Unguenta** or ointments officinal in the U. S. Pharmacopœia :—

Unguentum (Unguentum Adipis, U.S.P. Ed. 1860.)	Unguentum Hydrargyri Oxidi Flavi
“ Acidi Carbolici	“ “ “ Rubri
“ Acidi Tannici	“ “ Compositum
“ Antimonii	“ Mezerei
“ Aquæ Rosæ	“ Picis Liquidæ
“ Belladonnæ	“ Plumbi Carbonatis
“ Benzoini	“ “ Iodidi
“ Cantharidis	“ Potassii Iodidi
“ Creasoti	“ Stramonii
“ Gallæ	“ Sulphuris
“ Hydrargyri	“ “ Iodidi
“ “ Ammoniaci	“ Tabaci
“ “ Iodidi Rubri	“ Veratriæ
“ “ Nitratis	“ Zinci Oxidi.]

ÆTHER—ETHER.¹

[Used in preparing Acidum Tannicum, Ceratum Sabinæ, Oleoresina Capsici, Oleoresina Cubebæ, Oleoresina Filicis, Oleoresina Lupulinæ, Oleoresina Piperis, and Tinctura Opii Deodorata.

OFFICINAL PREPARATIONS, U. S.

Æther Fortior—pure ether (for producing anæsthesia).

Spiritus Ætheris Compositus (Hoffmann's Anodyne).

℞.—xxx.

Ether fortior is used in preparing Aconitia, Atropiæ Sulphas, Collodium, Collodium cum Cantharide, Oleum Æthereum, and Oleoresina Zingiberis.]

LOCAL ACTION.

Physiological.

The projection on the skin of a very fine spray of spe-

Therapeutical.

Advantage has been taken of the insensibility to pain

¹ [The class of **Ætherea**, U. S. P., comprises Æther, Æther Fortior, Chloroformum Purificatum, and Oleum Æthereum.]

cially pure ether, by means of Dr. Richardson's ingenious instrument, causes at first a sensation of extreme cold, attended occasionally by the formation of ice. In about a minute, or even less, to this succeeds a sudden blanching of the surface, the skin becoming hard and quite insensible, and a sharp cutting pain, like a burn, being at the same time experienced.

If this action is kept up for some time, redness, tingling, vesication, and even sloughing may be produced.

Be careful always to procure the pure anæsthetic ether, which has a high boiling point, and evaporates rapidly, as ordinary qualities of the drug are of no use for local anæsthesia.

produced by the ether spray, to use it extensively during the performance of many minor operations, and more especially in those which consist merely of a single cut or prick. Under these conditions it acts admirably, but the hard and brawny state of the integument produced by its action renders it of little or no aid where dissection or manipulations of deep-seated structures are required. Further objections to its use are the acute pain attending application, and the subsequent redness, tingling, and irritation of the skin.

It has also been recommended as a sedative in *neuralgia*, and as a convenient means of applying intense cold; and cases of its successful employment in *chorea*, applied to the upper part of the spine, have been recorded.

INTERNAL ACTIONS.

Ether, when taken internally, is stimulant and antispasmodic.

It is therefore a useful remedy in *hysteria*, *flatulence*, *spasmodic asthma*, etc.

COMBINED INTERNAL AND EXTERNAL USE.

Physiological.

Ether has powerful anæsthetic properties, and differs from chloroform in the following respects. It increases instead of diminishing the

Therapeutical.

The stimulant action of ether on the heart has caused its use to be warmly advocated as in all respects superior to chloroform. It

arterial pressure, and acts as a tonic to the heart, which continues to pulsate in fatal cases after the arrest of breathing. The following is the order of involvement of the nerve centres:—

1. The cerebrum.
2. The sensory centres of the cord.
3. The motor centres of the cord.
4. The sensory centres of the medulla oblongata.
5. The motor centres of the medulla.

cannot, however, be considered absolutely safe, and it labors under several disadvantages, such as the greater length of time required to produce anæsthesia, the violent struggling occasionally observed, the disagreeable smell of the drug, &c.; and it is therefore doubtful whether it will ever effectually displace the more commonly-used anæsthetic [¹].

MODE OF ADMINISTRATION.

It is most important that no air be admitted during ether administration, as most violent resistance and dangerous struggling supervene if the vapor be not inhaled in a state of purity. Non-attendance to this point caused ether to fall into discredit soon after its original introduction, and it is only lately that we have been fully convinced that, by using this simple precaution, we may readily obtain complete anæsthesia and perfect muscular relaxation in from three to eight minutes. Various inhalers have been devised to fit tightly over the mouth and nose, and it is here essential that some instrument of the kind should be used.

When operating by artificial light, do not forget the inflammable nature of the vapor of ether.

¹ [These strictures must be considered as the criticism of an English author upon English ether, which is declared to be of very inferior quality, by those who have had an opportunity of personally comparing it with the American. This explains the adherence of the English to chloroform, in spite of its acknowledged greater danger; and at the same time prevents them from understanding the popularity of ether in the United States. The fact is that the washed ether (*æther fortior*, U. S. P.) as made by Dr. Squibb, Powers & Weightman, and others, is perfectly free from the objections just stated; it is pure, nearly odorless, and efficient in almost the same doses as chloroform, while it is incomparably safer than its rival.]

ALCOHOL—ALCOHOL.

[*Spirit of the specific gravity 0.835, U. S.*

OFFICIAL PREPARATIONS, U. S.

Alcohol Dilutum. Diluted one-half with water.

Alcohol Fortius. Spirit of the specific gravity 0.817.

Spiritus Ætheris Nitrosi. Dose f3ss.-ij.

Vinum Xericum. Sherry wine (about 19 per cent. alcohol).

Vinum Portense. Port wine (about 23 per cent. alcohol).

Spiritus Vini Gallici. Brandy (about 50 per cent. alcohol).

Spiritus Frumenti. Whiskey (about 50 per cent. alcohol).

Spiritus Myrciæ. Bay rum (for external use).

(**Spiritus Geneva,** gin, is not official; the **Spiritus Juniperi Compositus** of the Pharmacopœia may be regarded as its equivalent.)]

ANTIDOTES.

The treatment of acute alcoholic poisoning must consist in removing all the spirit from the stomach by means of the stomach-pump, and endeavoring to rouse the patient from his perilous state of coma by cold affusion, strong coffee, surface stimulation, and galvanism, whilst artificial respiration may be employed to stimulate the flagging breathing powers. In more chronic cases, withdraw all stimulant absolutely and at once; insure sleep by chloral and bromide of potassium; and try to diminish the morbid craving by capsicum, nux vomica, the mineral acids, and a liberal and varied diet.

LOCAL ACTIONS.

Physiological.

Alcohol has some external astringent properties from its power of hardening albumen and thus condensing the tissues, whilst, from its rapid evaporation, it produces a cooling effect.

Therapeutical.

This hardening process has been turned to practical account for the prevention of bedsores, and alcohol is also a usual ingredient in the now somewhat old fashioned spirit or evaporating lotions.

INTERNAL ACTIONS AND USES.

1. *On Brain and Nervous System.*—Alcohol primarily stimulates the cerebral centres by dilating their arteries, and so admitting more blood; secondly, excitement supervenes with impaired muscular co-ordination, and finally coma, which may prove fatal if the dose taken be sufficiently large. Whilst it may also in small doses stimulate the spinal cord, in larger quantities it undoubtedly weakens the functions of that structure, causing indisposition for active exertion, as well as actual want of power. This has been proved by the experience of campaigns, but more especially that in Ashantee, where it was found that alcohol distinctly diminished the power of bearing fatigue, and also by the experiments of Parkes, which showed most conclusively that 2 or 3 ounce doses of spirit given several times per diem to a couple of healthy men engaged in laborious work, caused a slight primary increase of energy, but a secondary well-marked indisposition for muscular exertion, with actual diminution of bodily vigor. Dr. Wilks has also drawn attention to a remarkable series of cases in which

1. A moderate quantity of alcohol stimulates the mental faculties, whilst larger doses become narcotic and even anæsthetic. In chronic nerve debility, as *neuralgia*, we may often relieve pain by the use of stimulants; but these are precisely the class of cases in which habits of intemperance are most readily formed.

Nothing seems better proved than the fact that alcohol lessens the capacity for active muscular exertion, and it is therefore well to advise sportsmen, soldiers, and others who are about to undergo severe bodily fatigue, to reserve all stimulant until their day's work is over, when it may be of real service. In the Ashantee campaign a ration of rum on reaching camp at night seemed to revive the men after their labors.

In those cases of chronic alcoholic poisoning described by Wilks, we must follow his advice, and entirely cut off all supplies of strong drink.

paraplegia, with numbness, anæsthesia, and violent shooting pains, have been caused by the excessive and long-continued use of alcohol.

On the sympathetic system the effects are somewhat varied ; for although the dilatation of certain vascular areas must depend on paralysis of these nerves, there seems no doubt that, as Binz has shown, alcohol in inflammatory conditions stimulates the sympathetic, contracts the arterioles, and prevents that migration of the white corpuscles which constitutes the essence of this morbid process. The chronic abuse of alcohol causes nervous tremors and debility, gradually leading up to that semi-maniacal state known as delirium tremens, in which the victim is haunted by the constant presence of spectral illusions, preventing sleep, and finally wearing him out if unchecked. The brain, like most of the internal organs of the body, suffers in alcoholism from the contraction of new areolar tissue pressing upon and obliterating some of the nervous elements.

2. *On Heart and Circulation.*—Alcohol in moderate doses has a stimulating in-

This is, no doubt, one explanation of the beneficial action of alcohol in some cases of acute inflammation.

II. To its action on the circulation, however, we must ascribe a good deal of

fluence on the heart, and dilatation of the peripheral vessels and of those of the brain is produced.

In chronic alcoholism we find a degenerated condition of the larger vessels, known as atheroma.

the beneficial influence of alcohol in the treatment of disease. When the powers of life show signs of failing, when the first sound of the heart grows weak, the pulse feeble, compressible, and irregular, when syncope threatens, and delirium is beginning, the indications for the administration of alcohol are complete, and it will be found to act well when the tongue moistens, the pulse gains in volume and regularity, sound refreshing sleep is obtained, and the temperature falls. It is, of course, difficult to lay down exact rules as to the precise stage of fevers at which we may best prescribe alcohol, but ordinarily we should do so in *typhus* about the seventh day, in *typhoid* the twelfth, in *smallpox* when the secondary fever is developed, and in acute inflammations, generally, when the heart begins to fail, and the nervous system to show indications of debility.

3. *Respiration and Temperature.*—The old observations of Liebig seemed to show that alcohol was a respiratory food, and was largely burnt off in the lungs, thus aiding in the production of animal heat. It is now found, however, that under its use the car-

III. This lowering of temperature must also be explained by diminished tissue metamorphosis, and by a partial arrest of the oxygen-bearing function of the red corpuscles of the blood. It is therefore evident that we must warn persons about to be exposed to severe cold

bonic acid given off from the lungs is diminished, and that the body heat is lowered. When but small doses are taken, only a slight cooling effect is produced, whilst large quantities may reduce the temperature by two or three degrees, the explanation being partly that the dilatation of the cutaneous vessels enables more blood to be removed from the heat-producing centres, spread out and cooled in the wide sheet of the superficial circulation, and then returned, to abstract more warmth from the internal organs. Another curious fact is that alcohol also diminishes the power of resistance to cold; and this has been proved not only by the experience of Arctic voyagers, but by the following experiment: If we place two animals, one of which has been dosed with alcohol, in a chamber of which the temperature has been reduced to 10° below freezing point, both will speedily be benumbed to sleep; but whilst the healthy animal will be supported by the combustion of its tissues and survive the shock, its companion will perish from this heat-producing process being interfered with by the spirit.

4. *Intestinal Tract.*—In

of the fallacious nature of the old notion that alcohol furnishes true warmth.

There can, however, be no doubt that we may often alleviate the evil effects of a chill by a dose of spirit [especially in the form of a hot toddy], which releases the capillaries of the skin from their state of morbid contraction, and thus prevents congestion of internal organs.

IV. Alcohol is often bene-

small doses, alcohol stimulates the appetite and increases the supply of gastric juice ; but if given in larger quantities, this secretion is checked, nausea is produced, and the desire for food disappears. In the advanced stages of chronic alcoholism, the stomach is injured by the contraction of the new areolar tissue obliterating its glands, and hence we find dyspepsia with morning vomiting a very common symptom in drunkards.

5. *Secreting Organs.*—Alcohol stimulates the liver, and this organ is one of the first to suffer from chronic abuse of stimulant, the areolar tissues being irritated, and an increased formation taking place, which gives a primary enlargement to the organ. These newly formed structures, however, having the tendency to shrink or contract, gradually obliterate the true secreting elements of the gland, which grows smaller and harder, ascites eventually following from pressure on the portal vein and obstructed return of blood from the abdominal circulation.

Kidneys.—Alcohol has no specially well-marked effect on the urinary secretion, but the kidneys may also suffer from the cirrhotic degeneration just described.

ificial in the case of weakly persons, and more especially at the extremes of life, by giving tone to the digestive organs and aiding the due assimilation of food. Although its use is by no means essential to the healthy, it is of great service to dwellers in large towns, and others whose mode of life involves much mental strain. [Spirits should never be taken into an empty stomach, but should be accompanied by food.]

MODE OF ELIMINATION.

Alcohol very rapidly enters the blood, and is rapidly given out, in small part at least, by the breath, but it probably 'undergoes combustion to a great degree in the body, maintains or increases the body weight, and prolongs life on an insufficient diet. It is therefore entitled to be reckoned as a food' (Brunton). Much discussion has been expended on its elimination or otherwise, and some years ago the hopes of temperance agitators were much raised by the apparent result of experiments put forward by two French observers, which seemed to prove that all the ingested alcohol is given out unchanged in the urinary secretion. Anstie and Dupré, however, showed the fallacy of this by pointing out that even the urine of the most rigid abstainers contains a substance which cannot, by the chromic acid test, be distinguished from alcohol, and it has since been asserted that this may actually be alcohol derived from converted liver sugar. The most recent researches of Binz seem to establish the conclusion that, unless the quantity of spirit taken be very large, little or none is really eliminated by the urinary secretion.

As regards the dose of alcohol it is manifestly impossible to lay down any hard and fast rules, as we must of necessity be guided by the constitution of the patient and the symptoms of his special case. As a rule we may say that about 8 oz. of brandy may be sufficient in typhus or any acute illness, and that 16 oz. may be looked upon as the quantity which it is well not to exceed. In a state of health, 2 oz. of absolute alcohol per diem is usually considered a maximum allowance. But we must always remember the golden maxim, never to permit stimulants to enter the stomach save in combination with food.

It is of some importance to consider the forms of alcohol best adapted for varying cases, and we may say, generally, that champagne acts well in sudden and rapid sinking, whilst good whiskey or brandy may be recommended in ordinary acute illness. Port and Madeira are well suited for cases of debility; and in convalescence from acute illness and digestive feebleness, malt liquors and Burgundy will often be found to be of great service; but we must always beware of the possibility of leading our patients

into disastrous habits of self-indulgence by a lack of precision in our directions as to quantity.

[By the action of sulphuric and nitric acids upon stronger alcohol, nitrous ether is produced, which in combination with alcohol is called—]

SPIRITUS ÆTHERIS NITROSI.

This preparation, in doses of from $\frac{1}{2}$ fl. drachm to 2 fl. drachms, is diuretic and diaphoretic, and is much used in feverish conditions.

[SPIRITUS ÆTHERIS COMPOSITUS.

This is an alcoholic solution of ether, impregnated with oil of wine, and is popularly known as Hoffmann's anodyne liquor. It is used in *hysteria* and *nervousness*. Dose f3ss.—ij.

Spiritus.

The officinal spirits are : —

Spiritus Ætheris Compositus	Spiritus Juniperi Compositus
" " Nitrosi	" Lavandulæ
" Ammoniaë	" " Compositus
" " Aromaticus	" Limonis
" Anisi	" Menthæ Piperitæ
" Camphoræ	" " Viridis
" Chloroformi	" Myrciæ
" Cinnamomi	" Myristicæ
" Frumenti	" Vini Gallici.]
" Juniperi	

[ALCOHOL AMYLICUM—AMYLIC ALCOHOL.

Syn. Fusel Oil.

A peculiar alcohol obtained from fermented grain or potatoes by continuing the process of distillation after the ordinary spirit has ceased to come over. U. S.

Amylic alcohol is an active irritant poison, for which no direct antidote is known.

OFFICINAL PREPARATIONS, U. S.

Ammonii Valerianas and Quiniæ Valerianas.

In addition to valerianic acid and its salts, amylic alcohol is used in the manufacture of the non-official nitrite

of amyl, which has become of sufficient interest to warrant extended notice. It has come into general use, although not yet accepted by the Pharmacopœia.]

AMYL NITRIS.

[Not Official.]

LOCAL ACTION.

Nitrite of amyl is not possessed of any local irritant or sedative properties.

INTERNAL ACTIONS.

Physiological.

I. *Nervous System.* — 1. *On Brain.* — No special effect is produced on this organ beyond that resulting from dilatation of the cerebral vessels, and consisting of a sensation of fulness and oppression in the head.

2. *On Spinal Cord.* — A distinct lowering of reflex irritability has been observed.

II. *Vascular System.* — 1. *On Heart.* — After a brief inhalation of this drug, the action of the heart becomes excessively rapid, the face flushes, and a violent throbbing in all the arteries is experienced; and if its administration is pushed up to

Therapeutical.

I. — 1. It has been recommended as a remedy for *epilepsy*, in virtue of its dilating powers releasing the vessels of the brain from that condition of partial spasm which is said to be the cause of the disease. There is at present, however, no satisfactory clinical evidence in its favor.

2. It has been theoretically recommended in cases of *tetanus* and *strychnia poisoning*, and in *neuralgia* its inhalation has apparently been followed by relief.

II. — 1. The nitrite of amyl has been proposed as an antidote in *chloroform poisoning*.

poisonous limits, there is much weakening of the cardiac pulsations.

2. The effect on the arterial system is one of marked dilatation, the vessels enlarging, as proved not only by general flushing, but by congestion of the retina, and by the free flow of blood from cupped surfaces which had previously yielded only a few drops. The arterial tension becomes much lowered, and this enlargement of the calibre of the vessels has been proved to depend on a direct action of the drug on the muscular coats of the arteries, and not on any intervention of the vaso-motor system.

It has also been proved that oxidation is diminished, that the hæmoglobin of the blood is checked in its function of absorbing and giving up oxygen, and that, previous to death, the color of the arterial and venous blood becomes almost precisely alike.

III. *On Respiration and Temperature.*—During the early stage of amyl inhalation the respiration is hurried, but when the administration is further pushed the breathing becomes slower, and finally extinguished, from the arrest of the corpuscular action noted above,

2. In consequence of this dilating effect on the vessels, amyl has been most successfully used in *angina pectoris*. The essential condition here is supposed to be one of spasmodic contraction of the smaller pulmonary and systemic vessels, against which the heart, generally weakened, as it is in this disease, by mal-nutrition of its muscular structures, finds itself unable to cope, and hence the agonizing distress. Inhalation of the drug releases the spasm, and so gives ease; and this result follows whether there be actual valvular disease or not.

III. Amyl has been successfully used during the paroxysm of *spasmodic asthma*, acting, no doubt, by relaxing the muscular walls of the bronchial tubes.

and from a paralyzing effect on the respiratory nervous centre. The temperature tends to fall, from the diminution in the process of oxidation.

IV. *On the Digestive System.*—The presence of sugar in the urine has been observed during amyl inhalation, this being probably due to dilatation of the hepatic vessels.

IV. Amyl has been theoretically recommended in *cholera*, but there is no special evidence in its favor.

Amyl is now known to act more speedily and effectually when inhaled than when taken by the mouth, and from 2 to 5 drops placed on a handkerchief are cautiously drawn into the lungs until the characteristic flushing is produced.

No special accidents are recorded as having arisen from its use; but the caution seems a reasonable one, not to recommend it rashly to old persons with brittle or calcareous arteries, as the sudden alteration of calibre might be attended with danger. Possibly also it might be advisable not to recommend it to very plethoric patients, whose brains are already fully filled with blood.

Anæmic patients seem to be specially tolerant of its use.

[ALLIUM—GARLIC.]

The bulb of Allium sativum, U. S. (Dose of the fresh bulbs ʒj.-ij.)

OFFICINAL PREPARATION, U. S.

Syrupus Allii. Dose fʒj. (for an infant μ v.-x.).

Garlic is a stimulating expectorant, and is used with good effect in the latter stages of *catarrhal bronchitis*, or suffocative catarrh in young children, in which cases it may also be used as a poultice to the chest. These poultices composed of the fresh bulbs pounded into a mass, used either alone or with an equal quantity of linseed meal, may also be used in infantile convulsions, applied to the back and legs, or the oil of garlic may be used as a rubefacient.

The following would be an appropriate formula for the catarrhal bronchitis of infants:—

R. Syr. Allii	f℥j.;
“ Ipecacuanhæ	f℥ij.;
“ Tolutani	f℥v.;
“ Acaciæ	f℥vj.;
Tinct. opii camphorata	q. s. ad f℥ij.
M. S. Dose	℥xx to f℥j.]

ALOE—ALOES.

[**Aloe Barbadosis**, Barbadoes Aloes. The inspissated juice of the leaves of *Aloe vulgaris*, U. S.

Aloe Capensis, Cape Aloes. The inspissated juice of the leaves of *Aloe spicata*, and of other species of *Aloe*.

Aloe Socotrina, Socotrine Aloes. The inspissated juice of the leaves of *Aloe Socotrina*.

OFFICINAL PREPARATIONS, U. S.

Aloe Purificata, purified aloes. Dose gr. v.—x.

Pilulæ Aloes. (Aloes and soap, āā 1 part.) 2 grs. aloes in each pill.

Pilulæ Aloes et Assafoetidæ. (Aloes, assafoetida, and soap, āā 1 part.) 1 1/3 grs. aloes in each pill.

Pilulæ Aloes et Mastiches. (Aloes 4 parts, mastic and rose, āā 1 part.) 2 grs. in each pill.

Pilulæ Aloes et Myrrhæ. (Aloes 4 parts, myrrh and aromatic powder, āā 1 part.) 2 grs. in each pill.

Pilulæ Rhei Compositæ. (Aloes gr. jss., rhubarb gr. ij.)

Pulvis Aloes et Canellæ. (Aloes 4 parts, canella 1 part.)

Tinctura Aloes. (℥ss. to Oj.) Dose f℥j.—ij.

Tinctura Aloes et Myrrhæ. (āā 3jss. in Oj.) Dose f℥i.—ij.

Tinctura Benzoini Composita. Dose ℥x.—xxx.

Vinum Aloes (aloes, cardamom, and ginger, in sherry wine). Dose f℥j.

Suppositoria Aloes. Each containing gr. ij. of purified aloes.]

Physiological Action.

Therapeutical Action.

Aloes acts on the lower part of the large intestine, Aloes is a very certain, efficient, and mild purga-

stimulating its peristaltic movements, and causing the evacuation of formed and only slightly softened fæces. It also increases the secretion of bile, and some authorities hold that its purgative action is merely secondary to this. A good deal of congestion about the rectum is produced, and a sympathetically stimulating effect may extend to the uterus, and tend to excite its functions.

tive [in doses of ten to twenty grains], acting, however, rather slowly, and seldom producing its effect before from six to twelve hours.

It occasionally, however, gripes, and is therefore usually given in combination with other remedies which diminish this tendency, and, from its action on the lower bowel, it must be avoided in any local inflammatory condition, or in the acuter forms of hæmorrhoids.

Its mild and slow action has caused it to be much used in dyspepsia; it forms a principal constituent of most dinner pills; and it is also a popular remedy in habitual constipation. It has also emmenagogue properties, depending partly, no doubt, on the sympathy of contiguity; and in the form of pill or decoction, and given, as laid down by Graves, at the time when the catamenia are naturally expected, it often proves most efficient. [The purified aloes should be used, as the commercial aloes contains impurities.]

Dose, &c.

'The most useful preparations of aloes are, the compound decoction, dose fʒj. to fʒij.;¹ the pil. aloes et myrrhæ; and aloes and iron, dose 5 to 15 grains.

¹ [This is a favorite preparation of the British Pharmacopœia. It

[ALTHÆA—MARSHMALLOW.

The root of Althæa officinalis, U. S.

Marshmallow is a demulcent, as it contains chiefly mucilage and starch. It is occasionally exhibited as a decoction in fevers, or in inflammation of mucous membranes. In the form of a confection it is popular as a pectoral.]

ALUMEN—ALUM.

[**Aluminii et Ammonii Sulphas, U. S.** Alum.
Alumen Exsiccatum. Dried alum.]

LOCAL ACTION.

Physiological.

Alum, used externally, tends, like most astringents, to contract the blood-vessels and condense the tissues by coagulation of their albumen.

Therapeutical.

It is therefore much employed as an astringent lotion in *conjunctivitis, leucorrhæa, gonorrhæa*, and as a gargle in sore throat. [Dried alum is a mild escharotic for exuberant granulations, etc.]

INTERNAL ACTIONS AND USES.

1. *On Nervous System.*—Alum seems to have some power in relieving spasmodic action.

2. *Circulation.*—This, no doubt, is intimately connected with No. 1, as the con-

1. It is therefore beneficial in some cases of *whooping-cough*, and in *colica pictonum*. [In *whooping-cough* it is given in small doses—gr. j. -ij.—in syrup and water several times daily. It is also one of the best direct emetics in *croup*. Dose ʒss., repeated every half-hour if necessary.]

2. Alum has been used for internal *hæmorrhage*, and to check *excessive sweating*,

contains aloes, licorice, carbonate of potassa, myrrh, saffron, and tincture of cardamom, and is gently cathartic. Suppositories of aloes are used against ascarides.]

traction of the blood-vessels and internally astringent effects which follow the use of alum are probably dependent on nervous influence.

3. *On Secretion.*—Alum occasionally acts both as an emetic and as a purgative.

and its action in *whooping-cough* is also largely due to its astringent properties, as it is most useful in the later stages, when profuse secretion has been established.

3. This also explains its use in *colica pictonum*.

DOSE.

In lotion, gr. ij. ad x. :—

R. Aluminis	gr. x. ;	
Aquæ rosæ	f℥iv.	M.

Lotion in *catarrhal ophthalmia*.

Internally, gr. x. ad xx. :—

R. Aluminis	℥ij. ;
Acidi sulphurici dil.	f℥j. ;
Syrupi limonis	f℥i. ;
Aquæ	f℥ij.
M. Dose f℥ss. secundâ quâque horâ.	

In *colica pictonum*.

As purgative, gr. xl. ad lx.

[Dried alum may be given in pill (gr. ij.) in *hæmoptysis*.]

[Aluminii et Potassii Sulphas. Potassa-Alum, U. S.
Aluminii Sulphas. Sulphate of Aluminium, U. S.

The potassa-alum has the same medical properties as the officinal alum, just considered, and, in fact, was the *Alumen* of the *Pharmacopœia* in the edition of 1860.

The sulphate of aluminium is antiseptic and astringent. It has been used to fill carious teeth, and in solution is employed to inject and preserve subjects for dissection.]

[AMMONIACUM—AMMONIAC.

A gum-resinous exudation from Dorema Ammoniacum, U. S.

OFFICIAL PREPARATIONS, U. S.

Mistura Ammoniacy. Dose f℥ss.

Pilulæ Scillæ Compositæ. Dose pills i.—ij.

Emplastrum Ammoniacy.

Emplastrum Ammoniacy cum Hydrargyro.

INTERNAL EFFECTS.

Ammoniac may be used in *chronic bronchitis* with defective secretion, but its systemic influence is not very evident. It is given in substance (dose gr. x.-xxx.) or rubbed up with water so as to form the *Mistura Ammoniæ*, or milk of ammoniac. The pills (each containing squills gr. ss., ginger and ammoniac, āā gr. ij. with soap) are expectorant and stimulating. The plasters are resolvent and mildly counter-irritant, being useful in enlarged joints and scrofulous tumors.]

AMMONIA—AMMONIA.

[OFFICINAL PREPARATIONS, U. S.

Aqua Ammoniæ Fortior. (About 26 per cent. of Ammonia.)

Aqua Ammoniæ. (About 10 per cent. of Ammonia.)

Linimentum Ammoniæ. (Aq. Ammon. $\frac{1}{3}$, oil $\frac{2}{3}$.)

Liquor Ammonii Acetatis. Dose f 3ss.-j.

Spiritus Ammoniæ. Dose ℥ x.-xv.

Spiritus Ammoniæ Aromaticus. Dose f 3ss.-j.

Tinctura Guaiaci Ammoniata. Dose f 3j.

Tinctura Valerianæ Ammoniata. Dose f 3j.-ij.

Aluminii et Ammonii Sulphas (Alum).

Ammonii Benzoas. Dose gr. x.-xx.

Ammonii Bromidum. Dose gr. x.-xv.

Ammonii Carbonas. Dose gr. x.

Ammonii Chloridum. Dose gr. v.-xx.

Ammonii Chloridum Purificatum. Dose gr. v.-xx.

Ammonii Iodidum. Dose gr. v.-x.

Ammonii Nitras (used in making Nitrous Oxide.)

Ammonii Sulphas (used in making Ammonio-ferric alum).

Ammonii Valerianas. Dose gr. ii.-v.

Cuprum Ammoniatum. Dose gr. $\frac{1}{4}$ - $\frac{1}{2}$.

Ferri et Ammonii Citras. Dose gr. v.-x.

Ferri et Ammonii Sulphas. Dose gr. iij.-x.

Ferri et Ammonii Tartras. Dose gr. x.-xxx.

Hydrargyrum Ammoniatum, used in ointment.

ANTIDOTES.

The vegetable acids.]

LOCAL ACTION.

Physiological.

The stronger preparations of ammonia are irritating to the skin, causing redness and speedy vesication on account of their power of dissolving the cuticle.

Chloride of ammonium, on the other hand, is rather soothing, and cools the skin by aiding the speedy evaporation of fluids.

The vapor of ammonia is stimulant and irritating.

Therapeutical.

Ammonia is therefore a component part of many stimulating liniments, and is an excellent counter-irritant and vesicant. It is a good application to the sting of insects or the bite of poisonous snakes.

Chloride of ammonium used to be an invariable ingredient in evaporating lotions.

Ammonia is used by inhalation in *syncope*, and as an aid in the restoration of persons poisoned by prussic acid; but care must be taken not to allow its vapor to enter the air-passages too freely during unconsciousness, or serious inflammation may be produced.

CONSTITUTIONAL ACTIONS AND USES.

I. *On Brain and Nervous System.* — The preparations of ammonia, generally speaking, are stimulant in their action, affecting, however, rather the ganglionic and spinal systems than the brain proper, and thus differing from alcohol.

Ammonia in its various preparations is very largely used as a stimulant in many cases of exhaustion and debility. It is the best means of combating the depressing influence of *snake-bite*; it is invaluable in *bronchitis*, *pneumonia*, and all *typhoid conditions*, being more diffusible and less stupefying than alcohol; whilst in *prussic-acid poisoning* it may be administered internally as well as externally.

Chloride of ammonium has, according to Anstie, the property of giving increased tone to sensory nerves.

Chloride of ammonium is very serviceable in many cases of *neuralgia*, and in those wearing muscular pains in hard-worked women and others usually described under the term *myalgia*.

II. *Circulation and Respiration*.—Ammonia increases the force and frequency of the heart's action, this explaining some part of its stimulating influence. It may also aid the respiratory power by giving tone to the muscular fibres surrounding the bronchial tubes.

When injected into the blood, ammonia has the power of dissolving the red blood corpuscles [perhaps, to a moderate extent. But the chief source of danger after intra-venous injection lies in its power of interfering with the function of the blood-cell as an oxygen carrier. In cases of fatal ammonia poisoning the blood, after death, is found to be dark and to contain very little oxygen, nor will it absorb the gas and become arterialized when agitated in an atmosphere of pure oxygen. The red blood-corpuscle is also found to be altered and to show unusual resistance to the action of acetic acid.] And it is also supposed to diminish the coagulating property of the blood and to assist in the

It has therefore been used with success by Richardson in those cases where, as after delivery, *diphtheria*, *ovariotomy*, &c., a clot is forming in the heart, and he recommends it by injection into the veins, stopping short of solution of the red corpuscles.

solution of fibrinous concretions already formed.

III. *On Secretion.* — Under this head it may be convenient to place—

1. The *emetic* action which is specially developed by large doses of carbonate of ammonia. This effect is also produced by injection into the blood.

2. Ammonia increases the secretion from the bronchial mucous membrane.

3. *Intestinal.*—Ammonia in large doses increases the secretion from the intestines, and may cause diarrhoea, and it also neutralises acid secretions.

4. *Cutaneous.* — Ammonia, more especially in the form of liquor ammoniæ acetatis, acts freely on the skin.

5. *Urinary.*—No special action.

Finally, ammonia has been employed under various conditions which cannot conveniently be grouped under any precise physiological heading ; but these we will consider when we refer *seriatim* to the various preparations of the drug.

Poisonous Action. — If given in large quantities, ammonia may cause death by inflammation of the

1. Carbonate of ammonia is used as an emetic to assist in clearing the air-passages from accumulated mucus, and in some cases of poisoning.

2. This, in addition to the stimulant action, explains the great power of ammonia over *bronchitis* in the weak, young, or aged, and the later stages of *pneumonia*, where it promotes expectoration by thinning and rendering the sputa less tenacious.

3. It is never used as a purgative, but this irritating action on the bowels may render it an undesirable form of stimulant in enteric fever. It is a useful antacid.

4. Liquor ammoniæ acetatis is one of our best diaphoretics in a great variety of feverish conditions.

Antidotes. — [Vegetable acids and demulcents. The fixed oils may be administered, and the usual after-

stomach and intestines; and, treatment instituted for according to Richardson, it poisoning by the caustic may also kill by dissolving alkalies.] the red corpuscles of the blood.

MODE OF ELIMINATION.

Ammonia is very rapidly given out from the system, principally by the urine, but also in lesser degree by the breath and sweat.

PREPARATIONS.

Ammonia liquor fortior [Br.] and liquor ammonia [Br.]. These are seldom used internally, but occasionally as mentioned above, by vapor and injection. Dr. Halford, of Australia, has also proposed the employment of ammonia in this way to neutralize the poison of snake-bites; but, unfortunately, wider experience has not confirmed the promise of his earlier researches. Dose by injection, from 10 to 20 minims.

Ammonia carbonas. This is the most active and efficient preparation, used as a stimulant in doses of from 3 to 10 grs., as emetic 30 grs. Some authors have looked upon ammonia carbonas as a specific for *scarlet fever*, but of the soundness of this view no sufficient evidence has been produced. It is nauseous and pungent, and must be well disguised, milk being a good vehicle.¹

R. Ammonia carbonatis	gr. xl.;
Tinctura scillae	f℥ij.;
Syrupi tolutani	f℥iij.;
Infusi senegae	f℥vij.
Misce, fiat mistura.	Capiat unciam unam quartâ quâque horâ.

Stimulating expectorant.

Spiritus ammonia aromaticus. Dose f℥ss. to f℥j. This contains nutmeg, lemon, and spirit in addition to the ammonia.

Ammonii chloridum. Used as a tonic in neuralgia in doses of from 20 to 30 grs.; but it is very nauseous, resembling sea water in flavor.

¹ [Carbonate of ammonia must not be prescribed in combination with syrup of squill or syrup of garlic, as they contain acetic acid.]

R. Ammonii chloridi ℥ij. ;
 Ext. glycyrrhizæ ℥ss. ;
 Syrupi tolutani f℥j. ;
 Aq. cinnamomi ad f℥viiij.
 M. ℥j. quartis horis.

In *neuralgia*.

It has also, but with little real foundation, been supposed to possess some power of absorbing lymphatic and glandular enlargements, and has been regarded as a good remedy in chronic liver disease.

Ammonii bromidum seems to have an occasional and uncertain influence over *whooping-cough*, and is thought by some to be a good substitute for bromide of potassium in *epilepsy* and other nervous disorders. Dose 10 to 20 grs.

Liquor ammoniæ acetatis and liquor ammoniæ citratis. Diaphoretic in doses of from f℥ij. to f℥j.

R. Liq. am. acetatis f℥ij. ;
 Syrupi limonis f℥j. ;
 Sp. æth. nit. f℥ij. ;
 Infusi serpentariæ ad f℥viiij. M.
 Dose f℥j. quartis horis.

Diaphoretic mixture.

Ammoniæ benzoas, ammoniæ nitras, and ammoniæ phosphas are seldom if ever used.

NITROUS OXIDE GAS.

(Not Official.)

[*Made from nitrate of ammonia by heat.*]

Physiological Action.

Nitrous oxide, or the old laughing-gas, has been recently introduced as an anæsthetic, a very brief inhalation causing perfect insensibility, preceded occasionally by slight excitement, and attended by an amount of lividity which at first sight seems most alarming. It has been shown that this insensibility is simply a condition of modified asphyxia, as during

Therapeutical Action.

Nitrous oxide gas is very valuable for the performance of such small operations as tooth extraction; but anæsthesia cannot safely be kept up long enough to render it available during more prolonged surgical manipulations. During its administration we must rigidly exclude all atmospheric air, and thus prevent those violent and varied evidences of excitement which have so

narcosis only two-thirds of the normal amount of carbonic acid is given off, and immediately after recovery only one-third.

AMYGDALUS—ALMOND.

[**Amygdala Amara.** The kernel of the fruit of *Amygdalus Communis*, variety *amara*, U. S.

Amygdala Dulcis. The kernel of the fruit of *Amygdalus Communis*, variety *dulcis*, U. S.

OFFICINAL PREPARATIONS, U. S.

Mistura Amygdalæ (used as a vehicle).

Oleum Amygdalæ Amaræ. Dose gtt. $\frac{1}{4}$, in emulsion.

Oleum Amygdalæ Expressum (*dulcis*).

Aqua Amygdalæ Amaræ. Dose f $\frac{3}{4}$ ss.

Syrupus Amygdalæ (*Orgeat syrup*). Dose f $\frac{3}{4}$ j. to $\frac{3}{4}$ ss.

Unguentum Aquæ Rosæ (from oil of sweet almonds).

ANTIDOTES.

The antidotes to poisoning by the preparations of bitter almonds are the same as those of hydrocyanic acid.]

The bitter almond, being uncertain and dangerous, is never used in medicine; but sweet almonds, in the form of the mixture or powder, are of value as agreeable vehicles for the mixture or suspension of other drugs, and Dr. Pavy has taken advantage of their nutritive properties to propose them as a substitute for bread in saccharine diabetes.

[The effects of the oil of bitter almonds upon the system are identical with those of hydrocyanic acid, upon the presence of which its activity depends, but it is about four times the strength of the officinal *Acidum Hydrocyanicum Dilutum*. Bitter almond water, and the syrup, are used as vehicles for cough mixtures.]

AMYLUM—STARCH.

[*The feculum of the seed of the Triticum vulgare*, U. S.

Starch is used medicinally as an antidote to iodine, or as a demulcent in corrosive poisoning. In the form of a dusting powder it is applied to the skin of infants to prevent chafing or excoriation.]

Starch is a demulcent used with advantage to some irritable conditions of skin in the form of the glycerine of starch, and also as a medium for enemata.

ANGUSTURA—ANGUSTURA BARK.

[*The bark of Galipea officinalis, U. S.*]

Cusparia is a light tonic, rarely used. [It has fallen into disrepute, from the fact that it was occasionally found to be adulterated with nux vomica bark.]

ANISUM—ANISE.

[*The fruit of Pimpinella Anisum, U. S.*]

OFFICIAL PREPARATIONS, U. S.

Aqua Anisi. As a vehicle.

Oleum Anisi. Dose gtt. v.—xv.

Spiritus Anisi. (Oil f̄j. in Oj.).

Anise is carminative and stomachic, and is a favorite flavoring ingredient in medicines for children.]

Anise, Fennel, Coriander, Caraway, and Dill are agreeable aromatics, stomachics, and carminatives.

ANTHEMIS—CHAMOMILE.

[*The flowers of Anthemis Nobilis, U. S.*]

OFFICIAL PREPARATIONS, U. S.

Infusum Anthemidis. Dose f̄ij. as a tonic; as an emetic *ad lib.*

Oleum Anthemidis. Dose gr. v.—xv.

An agreeable aromatic, in small doses it is drunk as a tonic, and in large doses the hot infusion is taken as an emetic. A poultice is sometimes made of the boiled flowers.]

Chamomile has usually been considered a substance of no special therapeutic interest, being principally used by country people in the form of infusion as a remedy for *dyspepsia*; but within more recent years various German authorities, quoted by Phillips, have stated that the oil has a powerful lowering action on the reflex irritability of the spinal cord, and have proposed its use in cases of strychnia poisoning.

ANTIMONIUM—ANTIMONY.

[OFFICINAL PREPARATIONS, U. S.]

Antimonii Sulphuretum—the purified tersulphide (used in making the oxide).

Antimonii Oxidum. Dose gr. ij.—ijj.

Antimonii et Potassii Tartras. Dose gr. $\frac{1}{2}$ to j.

Antimonium Sulphuratum (sulphurated antimony). Dose gr. j.—xx.

Antimonii Oxysulphuretum (Kermes mineral). Dose gr. ss—j.

Pilulæ Antimonii Compositæ. (6 grs. of the mass contains one gr. each of calomel and sulphurated antimony.) Plummer's Pills.

Vinum Antimonii—gr. ij. ad f 3j. Dose gtt. x. ; as an emetic f 3j.

Emplastrum Antimonii (Tartrate of Antimony and Potassium 1 part in 4).

Unguentum Antimonii (do. do. 1 to 4).

Syrupus Scillæ Compositus (contains Tartar Emetic gr. j. ad 3j.).]

ANTIDOTES.

Emetics, tea, coffee, tannin, stimulants, &c.

LOCAL ACTION.

Physiological.

Externally applied, tartar emetic causes redness and inflammation of the skin, followed by an eruption of papules becoming vesicular, and finally forming pustules closely resembling those of smallpox.

Therapeutical.

Tartar emetic used to be extensively employed in the form of ointment as a counter-irritant, but was found occasionally to cause inflammation, and to leave unsightly scars.

INTERNAL ACTIONS AND USES.

I. Brain and Nervous System.—Tartar emetic under certain conditions, and more

I. Its use was originally recommended by Graves, and has been endorsed by

especially when combined with opium, exerts a sedative influence on the brain.

When given in poisonous doses, paralysis, probably of spinal origin, and attended with diminished reflex irritability, sets in.

II. *Circulation and Respiration*.—Antimony is sedative in its operation on the heart and vascular systems, the heart's action becoming slow, weak, and finally irregular, the arterial tension lowered, and the pulse soft and compressible. The respiration also grows slower, and an increased secretion takes place from the bronchial mucous membrane.

General muscular relaxation is observed.

Murchison, in the violent delirium of *typhus*, and it has also been employed with benefit in *delirium tremens*.

II. The depressing influence of tartar emetic on the circulation caused it to be very generally used in former years in acute inflammations, and more especially *pneumonia*; but this practice has now been almost generally abandoned, as it was found that such treatment, whilst exerting no real influence over the course of the disease, tended to reduce the strength of the patient, and cause lingering convalescence. Small doses, however, are found useful in *croup* [*spasm of the larynx*], and in the *broncho-pneumonia* of children where great dyspnoea and fever exist with excessive bronchial secretion, and it is a good general expectorant in *asthma*, [the first stage of] *bronchitis*, &c.

Its relaxing effects on the muscular system were formerly taken advantage of for the reduction of *herniæ* and *dislocations*; but it has of course been quite superseded by chloroform and other anæsthetics.

III. *On Secreting Organs.*

1. *Stomach and Intestines.*—Antimony is an effectual emetic, its action being slow, however, and attended by a good deal of depression. It acts either when swallowed, or by subcutaneous injection; but the balance of experiment goes to show that in either case the effect is produced by reflex action following irritation of the nerves of the stomach. Some increase of secretion from the intestines and consequent diarrhoea are occasionally observed.

2. In poisonous doses antimony causes irritation and inflammation of the stomach and intestines.

3. *Skin.*—Antimony has a powerful diaphoretic action.

Poisonous Action.—Death may occur from the collapse following prolonged vomiting and purging, or may be the result of gastro-intestinal inflammation. Post-mortem examination of a protracted case generally discovers parenchymatous degeneration of the liver and other internal organs.

1. Antimony is too slow and depressing an emetic to be used in cases of poisoning, but it is of service in *croup*, *whooping-cough*, *bronchitis*, &c., where we wish to relax the bronchi and get rid of accumulated secretions.

In former years, when antimony was freely given, what was called tolerance used to be an interesting therapeutic result. That is to say, in feverish conditions, it was found that large quantities of the drug might be taken without producing vomiting; and this has been explained by the observation that antimony, to act as an emetic, must previously be dissolved in the gastric juice, a secretion which is in great measure checked during fever.

3. Antimonial wine is a common adjunct to diaphoretic mixtures.

PREPARATIONS.

Antimonium tartaratum. [Antimonii et Potassii Tartras.] Dose, $\frac{1}{8}$ gr. to $\frac{1}{4}$ gr.; as emetic, 1 to 3 grs. In the bronchitis of children, from $\frac{1}{10}$ gr. to $\frac{1}{10}$ gr.

Vinum Antimonii. Dose, 15 to 40 minims.

Ung. Antimonii tartarati. [Unguentum Antimonii, U. S. P.]

Pulvis Antimonialis. This is the well-known patent preparation known as James's powder, which used to be more popular than it is now.

None of the other preparations of antimony have any therapeutic value.

MODE OF ELIMINATION, &c.

Tartar emetic rapidly enters the blood, and is eliminated by the bile, milk, sweat, urine, as well as the gastrointestinal glands.

PRESCRIPTIONS, &c.

Tartar emetic, on account of its tastelessness, may be well given dissolved in simple distilled water; and Ringer tells us, and I have amply confirmed his statements, that we may do much good, in some forms of acute bronchitis in children, by dissolving a grain of the salt in a pint of water, and giving a teaspoonful every quarter of an hour for the first hour, and then hourly.

In the case of adults, when we wish to avoid the nauseating effects of the drug, we may best do so by the following formulæ:—

R. Antimonii tartarati [Br.]	gr. ij.;
Acidi hydrocyanici diluti	℥xxx.;
Tincturæ [spiritus] lavandulæ comp.	f℥ss.;
Aquæ destillatæ	ad f℥vj. M.
Dose f℥ss. quartis horis. ¹	
R. Liq. opii sed. ²	f℥j.;
Antimon. et pot. tartratis	gr. j. ad gr. ij.;
Mist. [aquæ] camph.	f℥vj. M.
Sumat semunciam omni horâ donec somnus supervenerit.	

¹ [Each dose contains two and one-half minims of dilute hydrocyanic acid. This being the case, the first doses should not exceed f℥j.; nor should this be exceeded unless for good reasons.]

² [Battley's solution, non-official.]

Highly recommended by Graves and Murchison in the insomnia and delirium of *typhus fever*.

AQUA—WATER.

[*Natural water in the purest attainable state, U. S.*

Aqua Destillata. Distilled water.]

Water, both in its external and internal applications, enters so largely into medical practice as well as into domestic economy, that we cannot begin our studies better than by considering very briefly what is definitely known regarding its physiological and therapeutical properties.

LOCAL ACTION.

It will be found difficult, if not impossible, to balance the physiological and therapeutical actions of water in the manner followed generally throughout this work, and we shall therefore give a short collective sketch of the influence exerted by it on the various functions of the body.

It is not necessary for us to do more than refer to the universal use of water for washing and bathing purposes, but a word or two on the physiological effects of cold baths is required. We find that the action of the heart is increased, the respiration may become panting and irregular, the temperature falls, and the destructive metamorphosis of these tissues is augmented, as indicated by an increased excretion of urea; occasionally albumen appears in the urine, and so much mental shock is produced, more especially by sea-bathing, as to render this usually excellent tonic unadvisable in those of feeble constitution, in the very young and old, and in pregnant women, whilst the tendency to vascular strain must prescribe caution towards those in whom we have any reason to suspect a degenerated state of the arterial system.

Occasionally, during sea-bathing, the hair falls off, the process of digestion becomes impaired, and sleeplessness is experienced; and this, no doubt, arises from the process of tissue destruction not being thoroughly balanced by repair.

As regards the external uses of cold water in medical practice, we may refer to the beneficial action of water-

dressing and irrigation in surgery, to cold affusion in *laryngismus stridulus*, *chorea*, *hysteria*, the stupor of fevers and drunkenness, and, most of all, to the wonderful refrigerant action of cold baths in cases of abnormally high temperatures.

It is generally held that a fatal result almost inevitably occurs in any case where the [bodily] temperature remains above 107° [for several days at a time], and until very recently we were powerless to check the destructive influence of this complication. Within the last few years, however, Dr. Wilson Fox and others have shown that we may safely and effectually bring down this excessive heat in *rheumatism*, where it principally occurs, by placing the patient in a bath at 95° and gradually adding cold water or ice until 60° Fahr. is reached. In this way a reduction of from seven to twelve degrees may be readily effected, but we must remember one practical point, that the patient's temperature continues to fall, as much even as six degrees, for forty or fifty minutes after he has been removed to bed. Four or five baths may be required during the first day of treatment, the patient remaining immersed during twenty or thirty minutes; there can be no doubt that by watching our cases of rheumatism carefully, and adopting this mode of treatment whenever the thermometer registers more than 105° Fahr., we may save many lives.

The Germans use the cold bath very freely in all febrile disorders, but there is no evidence that their success is greater than under the treatment pursued in this country, which has the merit of being agreeable to the feelings of the sufferer.

Cold packing is an excellent stimulant to the skin, and is extensively employed at our hydropathic establishments.

Warm water is also very serviceable, and we may mention the soothing action of warm fomentation, the warm *douche* in early joint disease, and the use of the warm bath in the convulsive diseases of children, for the relief of colic, spasmodic stricture, hernia, gall or renal calculi, and in cases of extensive burns or moist skin diseases, employed after the manner of Hebra, whose patients frequently remain in a state of continuous soaking for days together.

Ice is a most valuable application for relieving pain and

checking inflammation in *orchitis*, *bubo*, *meningitis*, &c., as well as for the arrest of hæmorrhage, and to allay thirst and obstinate vomiting.

Vapor is often used as a soothing and relaxing application in *tonsillitis*, *bronchitis*, *croup*, &c., and, in the form of bath, to cause diaphoresis.

CONSTITUTIONAL ACTION.

When water is taken internally, it acts in some measure as a purgative by supplying moisture to the fæces ; it promotes digestion by stimulating the secretion of gastric juice, and aiding the passage of peptones into the blood (Ringer) ; and it is in some measure a diuretic, increasing temporarily the excretion of chloride of sodium, and more permanently the elimination of urea, phosphoric and sulphuric acids by the urine. It is, of course, the universal solvent, and its importance in the animal economy is shown by the fact that it constitutes about sixty-eight of the hundred parts which build up our entire bodily frame, and that five pints are given out from the body of one average-sized adult in the twenty-four hours. The urgent necessity for its purity is further proved by the leading part it has always taken in the spread of epidemics ; for not only cholera, but enteric fever, has thus been largely propagated, whilst entozoa are thus introduced into the system, and the presence of other impurities may give rise to dysentery, diarrhœa, goître, and yellow fever. [The most dangerous adulteration of drinking water is that occasioned by the presence of decaying organic or albuminoid matter. During epidemics of bowel affections, all water should be boiled previous to drinking.] Specific adulterations also, like lead, have frequently occasioned very painful and even fatal attacks of illness.

But we may derive great benefit in practice from the use of some of those very impure waters, deeply impregnated with various mineral ingredients, which are known as mineral waters, and which are met with in such profusion and variety both at home and abroad. Fashion, no less than undoubted success attending their use, has recently brought these naturally adulterated waters prominently forward, and it is very essential that every practitioner should have some knowledge of their chief constituents and

the principal health resorts where they can be partaken of in greatest perfection. Our ~~present~~ limits, however, will only permit a very bare enumeration of the principal classes into which mineral waters have been divided.

1st. We have the chalybeate or ferruginous class, which contains iron in varying proportion, in the form either of carbonate, as at [Excelsior Rock Spring, Saratoga,] Spa, Tunbridge Wells, and Harrowgate; or of sulphate, as at [Bedford Springs, Pa., Fairmount Park, Phila.,] Brighton, Isle of Wight, &c. They are possessed of tonic properties, and whilst we generally find them best borne as carbonate, we must be cautious of their use in very plethoric and full-blooded patients.

2nd. Acidulous or carbonated. These are agreeable and sparkling, holding in solution carbonates of lime, soda, and magnesia. They are met with at [Gettysburg,] Seltzer, and Carlsbad, and are serviceable in gout and dyspepsia.

3rd. Saline, some of which are purgative by containing the sulphates of magnesia and soda, as at [Saratoga, Congress Spring,] Cheltenham, Leamington, Friedrichshall, &c.; others, as Buxton, Bath, and Bristol, are impregnated with carbonate and sulphate of lime; others with chlorides, as Weisbaden, Baden-Baden; whilst a fourth class, as at Vichy and Ems, owe their properties to the alkaline carbonates which they contain. [Apollinaris and Hunyadi Janos waters belong to this class.]

4th. Sulphuretted or hepatic waters contain sulphuretted hydrogen in solution, and possess a very offensive taste and smell. They are chiefly met with at Harrowgate, Moffat, Cheltenham, Aix-la-Chapelle, [Virginia Sulphur Springs,] &c., and are principally used in chronic skin diseases.

[The class of **Aquæ** in the U. S. Pharmacopœia includes the following:—

Aqua Acidi Carbolici	Aqua Cinnamonomi
" " Carbonici	" Creasoti
" Ammoniac ¹	" Destillata
" Amygdalæ Amaræ	" Fœniculi
" Anisi	" Menthæ Piperitæ
" Aurantii Florum	" Menthæ Viridis
" Camphoræ	" Rosæ.]
" Chlorinii	

¹ [Aqua Ammonii Fortior is included in the primary list, and hence does not appear among the preparations.]

ARGENTUM—SILVER.

[**Argenti Cyanidum**—for making Acidum Hydrocyanicum Dilutum.

Argenti Nitras. Dose, gr. $\frac{1}{6}$ –ij., in pill.

Argenti Nitras Fusa—for external use.

Argenti Oxidum. Dose, gr. ss.–ij., in pill.

Antidote to Nitrate of Silver—Table salt.

Metallic silver is inert. As it occasions no chemical irritation in the tissues, canulæ are made of it for use in *empyema* to wash out the chest, &c. Silver wire is also used in surgery to unite the fractured ends of bones where there is delayed union, and for sutures in wounds of the scalp and elsewhere. The salts of silver are best administered in pill form, for which gum Arabic is probably the best excipient, as with vegetable extracts, or glucose, they are apt to explode.]

LOCAL ACTION.

Physiological.

The nitrate of silver hardens primarily, but secondarily destroys the cuticle, and condenses the tissues by coagulating their albumen. Its application may cause ulceration of the healthy skin, and checks the activity of granulating surfaces.

Therapeutical.

Nitrate of silver, either in substance or solution, has been used to check the spread of erysipelatous inflammation, to arrest the pitting of *smallpox*, and to avert the formation of bed-sores.

It is a good injection for gonorrhœa, or collyrium for *conjunctivitis*, and a strong solution is one of our best remedies for various relaxed or ulcerated conditions of the fauces. In substance, lunar caustic forms a good application to simple venereal sores, ulcerated tonsils, or to any ulcerating or granulating tissue, when we wish to repress exuberant granulations or excite a new and more healthy action.

INTERNAL ACTIONS AND USES.

Silver is now but little employed internally. It formerly enjoyed a certain empirical reputation in the treatment of *epilepsy* and other nervous disorders; but when it was found that not only no benefit resulted from its use, but that an indelible and peculiarly unsightly bluish-gray discoloration was occasionally developed on the skin, it became evident that the wisest course in future would be to discard nitrate of silver altogether as a constitutional remedy. [The oxide has been highly recommended as a nervous sedative, and as a hæmostatic in menorrhagia.]

ARNICA—ARNICA.

[*The flowers of Arnica Montanum*, U. S.

OFFICIAL PREPARATIONS, U. S.

Extractum Arnicæ. Dose, grs. v.—x.

Emplastrum Arnicæ (extract $\frac{1}{2}$).

Tinctura Arnicæ (3ij.—Oj.); used externally.]

EXTERNAL ACTIONS.

If applied to the skin for some time, arnica causes redness and irritation, and in some susceptible subjects most violent erysipelatous inflammation, even ending in death, has resulted. It must therefore be used with caution.

Some practitioners value arnica highly for the power which they believe it to possess of absorbing bruises and relieving sprains. Dr. Garrod, on the other hand, asserts that any power it seems to exercise in dispersing extravasations of blood is simply due to the spirit which the tincture contains. Dr. Phillips, again, tells us that the irritating effects never follow the use of an aqueous solution, which contains none of the arnicine or volatile oil.

INTERNAL ACTIONS.

The physiological and medicinal actions of arnica can only be balanced with difficulty, as the evidence regarding

the former is very conflicting, and the opinions on the latter certainly err in the direction of over-confidence. As it is rarely, if ever, used as a medicinal agent save by homœopathic practitioners, it does not seem necessary to say more about its asserted virtues.

ARSENICUM—ARSENIC.

[**Acidum Arseniosum.** Sublimed arsenious acid in masses, U. S. Dose, gr. $\frac{1}{20}$.

OFFICINAL PREPARATIONS, U. S.

Arsenici Iodidum. Dose, gr. $\frac{1}{8}$.

Liquor Arsenici et Hydrargyri Iodidi (℥xx. contains arsenic gr. $\frac{1}{24}$.) Donovan's solution. Dose, ℥x.

Liquor Arsenici Chloridi. (Acid. arsen. gr. iv. ad f℥j.) Dose, ℥v.

Liquor Potassii Arsenitis. (Acid. arseniosum, gr. iv. ad f℥j.) Fowler's solution. Dose, ℥v.

Liquor Sodii Arseniatis. (Sodii arseniat. gr. iv. ad f℥j.) Dose, ℥v.

Sodii Arsenias. Dose, gr. $\frac{1}{2}$.

Metallic arsenic is inert, and is not used in medicine. Arsenious acid is sometimes termed white arsenic, or, simply, arsenic, as in the following remarks.

ANTIDOTES.

The chemical antidotes to arsenious acid are freshly prepared hydrated sesquioxide of iron, and magnesia, freshly calcined. When Fowler's solution has been taken, the ferric salts are the antidotes.]

LOCAL ACTION.

Physiological.

Externally applied, arsenic causes redness and inflammation of the skin, followed by ulceration and sloughing.

Therapeutical.

Arsenic has been employed as a caustic in *cancer* and allied diseases; but not only is its action difficult to regulate, but dangerous symptoms of poisoning have resulted from the very ready way in which it is absorbed by the skin.

INTERNAL ACTIONS AND USES.

I. *On Brain and Nervous System.*—Arsenic has a tonic influence on the nervous system generally.

I. This may in some measure explain its anti-periodic properties, for it is well known that arsenic is only second to quinine in its power of arresting the various manifestations of *ague*.

It is also a valuable remedy in *neuralgia*, and *chorea* may frequently be cured by full doses.

II. *Circulation and Respiration.*—In small doses arsenic may stimulate cardiac action in a slight degree; and the experience of the arsenic-eaters of Styria shows that its use improves their wind, and enables them to undergo great exertion without fatigue.

II. Arsenic is of service in *asthma*, *hay-asthma*, and some forms of *chronic bronchitis*.

III. *On the Secreting Organs.*—1. *Digestive Tract.* In small doses arsenic stimulates the appetite and increases the digestive powers, but if used more freely symptoms of irritation set in, which may terminate in gastro-enteritis. [Some patients cannot take the smallest doses without great systemic disturbance. It is advisable to begin with minute doses and cautiously increase, watching the effect.]

III. Ringer recommends small doses of arsenic—1. In a form of *irritative dyspepsia* with red tongue and prominent papillæ, in the morning *vomiting* of drunkards, and in that variety of *diarrhœa* which leads to the evacuation of the bowels immediately after eating. It is now thoroughly established that the inhabitants of Styria eat arsenic to the extent of gr. j. to gr. ij., and thrive on it, becoming fat and ruddy, and that it is occasionally given to horses with the view of improving their coats.

2. *Cutaneous.* — Arsenic occasionally causes irritation and tingling of the skin, and even the appearance of eczematous eruptions.

2. In dry scaly affections of the skin, such as *psoriasis*, in the dry stages of *eczema* and *impetigo*, in *pemphigus*, and in *lichen*, arsenic acts most admirably; but we must be careful never to give it during the acute stage of any skin affection, as in these circumstances, it is invariably found to aggravate the symptoms. Arsenic is much valued by Balfour and others in *chronic rheumatism*, and more especially *rheumatoid arthritis*.

3. *Liver.* — Arsenic in poisonous quantities causes, like phosphorus, fatty or parenchymatous degeneration of the liver.

4. *On Urine.* — Nothing special has been described [except that the kidneys are the principal channel for the discharge of the poison from the system.]

Poisonous Effects. — Poisoning by arsenic is ushered in by [burning] pain in the stomach, vomiting, diarrhœa, headache, fever, and disturbed sleep, followed by more acute symptoms and death from collapse—a train of symptoms much resembling those met with in cases of true cholera. [Such phenomena occurring in the absence of any epidemic of Asiatic cholera, and coming on soon after eating, in a previously healthy person,

Antidotes. — After evacuation of the stomach, we must give light magnesia or the [fresh] hydrated sesquioxide of iron [followed by castor oil to evacuate the bowels. The case should then be treated on general principles].

should excite suspicion of arsenical poisoning.]

After death, in addition to the usual pathological appearances of gastro-enteritis, we find fatty degeneration of the heart and muscles, and parenchymatous degeneration of the liver, kidneys, &c. [Arsenic may generally be detected in the liver or contents of the stomach by Reinsch's or Marsh's Test.]

MODE OF ELIMINATION.

Arsenic is rather slowly removed from the body by the intestines, the urine, and perhaps the bile.

MODE OF ADMINISTRATION, CAUTIONS, &c.

Persons vary much in their susceptibility to arsenic, and we must invariably begin its use with caution, keeping in mind that children bear it well, and that a child of five can bear with impunity as large a dose as an adult. [Two grains of arsenious acid has caused death, according to Dr. Taylor.]

We must also remember that, although the Styrian peasants can accustom themselves to large and increasing doses, the experience of medical practice shows that, after a certain time, patients taking this drug are liable to show some of the following symptoms:—Smarting and itching about the conjunctivæ, with œdema, pain in the stomach, vomiting and diarrhœa, white tongue, and general digestive derangement; and when these indications of “accumulation” occur, it is not necessary to suspend the remedy altogether, but merely to diminish the dose.

The probabilities of these unpleasant symptoms are much lessened, however, by advising that the dose should always be taken after a meal.

The mode in which arsenic is usually given is in the form of liq. arsenicalis [Fowler's Solution—Liq. Potass. Arsenitis, U. S.], which is merely a solution of arsenious acid in carbonate of potash flavored with sp. lavand. co., containing gr. ss. in fʒj., and of which the dose is, as a general

rule, from \mathfrak{m} ij. to \mathfrak{m} v.; but in some obstinate affections, like chronic rheumatic arthritis, it is requisite to push the quantity as far as \mathfrak{m} x. or even \mathfrak{m} xv. Being almost tasteless, liq. arsenicalis is best given simply in water.

The liquor arsenici hydrochloricus, sodæ arsenias, and ferri arsenias are rarely used, their respective doses being 2 to 8 minims and $\frac{1}{12}$ gr. to $\frac{1}{2}$ gr.; and the liquor arsenici et hydrargyri hydriodatis [Donovan's Solution], which was supposed to have a special influence over syphilitic skin diseases on account of its combination of arsenic with iodine and mercury, has gone much out of fashion in these days. Dose, 10 to 30 minims. [The iodide of arsenic is sometimes used as an ointment in skin affections—gr. iij. to \mathfrak{z} j.]

ASSAFÆTIDA—ASSAFETIDA.

[A gum-resinous exudation, obtained by incision from the root of *Narthex Assafetida*, U. S. Dose, gr. v.—x.

OFFICIAL PREPARATIONS, U. S.

Mistura Assafætidæ (\mathfrak{z} iv. to Oj.) Milk of Assafetida. Dose, \mathfrak{f} \mathfrak{z} ss.—j.

Tinctura Assafætidæ (\mathfrak{z} ij. to Oj.) Dose, \mathfrak{f} \mathfrak{z} ss.—j.

Pilulæ Assafætidæ (each gr. iij.). Dose, 2 to 4.

Pilulæ Aloes et Assafætidæ (each gr. $j\frac{1}{3}$).

Pilulæ Galbani Compositæ (each gr. $\frac{1}{2}$).

Suppositoria Assafætidæ (each 5 grains, or \mathfrak{m} xv. of the tincture).

Emplastrum Assafætidæ.]

Physiological Actions.

A good deal of digestive disturbance seems to follow the administration of this drug to healthy persons; but the evidence is too conflicting to enable us to lay down any exact scheme of its influence on the various functions of the body.

Therapeutical.

Assafætida has been used and recommended in a considerable variety of affections, but practically it is now only prescribed in flatulent dyspepsia and in hysteria, where its excessively nauseous smell and taste are supposed to give it an advantage over other drugs of the same class.¹

¹ [Prof. H. C. Wood states that "assafetida is one of the most efficient of the so-called antispasmodics, and may be given to fulfil the same

AURANTIUM—ORANGE.

[**Aurantii Amari Cortex.** The rind of the fruit of *Citrus vulgaris*.

Aurantii Dulcis Cortex. The rind of the fruit of *Citrus aurantium*.

Aurantii Flores. The flowers of *Citrus aurantium* and *Citrus vulgaris*.

OFFICIAL PREPARATIONS, U. S.

Aqua Aurantii Florum. Used as a vehicle.

Syrupus Aurantii Florum. Used as a vehicle.

Confectio Aurantii Corticis. Used as a vehicle.

Syrupus Aurantii Corticis. Used as a vehicle.

Tinctura Aurantii. Dose, f℥j.—ij.

Infusum Gentianæ Compositum. Dose, f℥ss.—ij.

Tinctura Cinchonæ Composita. Dose, f℥j.—ij.

Tinctura Gentianæ Composita. Dose, f℥j.—iv.]

PROPERTIES.

The various preparations of orange require no detailed comment, for beyond the fact that those made from the rind are mildly tonic in virtue of their bitterness, and that the syrup and the orange-flower water are agreeable flavoring additions to a prescription, we have no evidence of their special therapeutic properties, if any exist. [The volatile oil of the flowers, obtained by distillation, is called, in commerce, oil of Neroli, and orange-flower water is hence sometimes termed Neroli water.]

indications as valerian in *functional spasm*, in *hysteria*, and *nervousness*. It differs from valerian in having a much more decided action upon the mucous membranes. It is an excellent carminative, and in the form of injection is constantly used for the relief of *tympanitis*. It also in small doses increases the appetite and affords relief in *dyspepsia*, with *flatulent colic* and *costiveness*, of the aged or hysterical. As a stimulating expectorant and antispasmodic, it is useful in *whooping-cough* and *chronic catarrh*. It is especially efficient in palliating the latter affection as occurring in old people, when the difficulty of breathing is paroxysmally increased by spasm of the bronchial tubes. In *infantile convulsions* and in severe *infantile colic*, assafetida enemata (℥ij. to ℥ss. of the milk) are exceedingly useful and harmless." *Therapeutics*, 2d ed., p. 191.]

[AVENÆ FARINA—OATMEAL.

The meal prepared from the seeds of Avena Sativa, U. S.

Extensively used as an aliment in the form of gruel. It is nourishing and slightly laxative. Three varieties are met with in the Middle States, the Ohio, the Canadian, and the Scotch oatmeal; the latter, being imported, brings a higher price, and is considered by some to be better, perhaps solely on that account. Its taste is less pleasant than the others, which are probably equally as good. Thin oatmeal gruel, strained and sweetened, forms a valuable and popular infants' food.]

BALSAMUM PERUVIANUM—BALSAM OF PERU.

[An empyreumatic liquid balsam obtained from Myrospermum Peruvianum, U. S.]

LOCAL ACTION.

Peruvian balsam tends to check copious and unhealthy secretions. It may therefore be used, like myrrh, as an application to foul and unhealthy sores.

CONSTITUTIONAL ACTION.

Like the other gum balsams, it acts on the mucous membranes, and more especially on the bronchial tubes. It has therefore been prescribed to restrain excessive discharges in *bronchitis*, &c. [Dose, fʒss. in emulsion.]

BALSAMUM TOLUTANUM—BALSAM OF TOLU.

[A semi-liquid balsam obtained from Myrospermum Toluiferum, U. S.]

OFFICINAL PREPARATIONS, U. S.

Syrupus Tolutanus. (Tinct. fʒij. to Oj.) Dose, fʒss.–j.**Tinctura Tolutana.** (ʒjss. in Oj.) Dose, fʒj.**Tinctura Benzoini Composita.** (Tolu ʒss. in Oj.)

This agreeable preparation is almost exclusively used as a flavoring addition to cough mixtures, in the form of the syrup.

[BARI CARBONAS—CARBONATE OF BARIUM.

Only introduced into the Pharmacopœia in order to provide a source for the—

OFFICIAL PREPARATIONS, U. S.

Barii Chloridum, and
Liquor Barii Chloridum. Dose, grs. xxx.—l.

ANTIDOTES.

Sulphate of magnesia, or dilute sulphuric acid.

INTERNAL EFFECTS.

Barium is only used in medicine in the form of liquor barii chloridum, which is recommended by Prof. Gross as an alterative in *scrofula*, particularly in cases distinguished by a tumid upper lip.]

BELLADONNA—BELLADONNA.

[Belladonnæ Folia. The leaves of *Atropa Belladonna*, U. S.

Belladonnæ Radix. The root of *Atropa Belladonna*, from plants more than two years old, U. S.

OFFICIAL PREPARATIONS, U. S.

Tinctura Belladonnæ. (From the leaves, $\frac{3}{4}$ ij. to Oj.)
 Dose, grs. x.—xx.

Extractum Belladonnæ. (Inspissated juice of the leaves.) Dose, gr. ss.—ij.

Extractum Belladonnæ Alcoholicum. (Of the leaves.) Dose, gr. ss.—ij.

Extractum Belladonnæ Radicis Fluidum. Dose, $\frac{1}{2}$ ij.

Emplastrum Belladonnæ. (From the root.)

Unguentum Belladonnæ. (From ext. belladonnæ, $\frac{3}{4}$ j. in $\frac{3}{4}$ j.)

Suppositoria Belladonnæ. (From ext. belladonnæ alc., gr. ss.)

Atropia. (From the root.) { Dose, gr. $\frac{1}{20}$, or hypo-
Atropiæ Sulphas. { dermically gr. $\frac{1}{20}$.

ANTIDOTES.

Chemical. Fresh animal charcoal, tannin, vegetable astringents, &c.

Physiological. Opium, Calabar bean, tartrate of antimony and potassa.

NOTE.—In the treatment of belladonna-poisoning, the irritating emetic, such as mustard, ipecacuanha, and sulphate of zinc, should be exhibited to remove from the stomach any excess of the poison remain-

ing unabsorbed. Apomorphia might be useful hypodermically (gr. $\frac{1}{20}$, repeated). Purgatives containing the chemical antidotes should then be given to neutralize any of the drug in the intestines. Symptoms of narcotism should be treated as they arise, by artificial respiration, douches, counter-irritants, and diffusive stimulants. The physiological antidotes, being counter-poisons, should be used with the greatest care.]

LOCAL ACTION.

Belladonna is used externally, on account of its soothing properties, in various forms of *neuralgic* and *rheumatic pains*, in which cases the liniment, applied either alone or in combination with chloroform liniment, often gives relief. It is also a good application in acute rheumatism, placed on cotton-wool and thus encasing the swollen and tender joints. Belladonna is also useful, as has been especially pointed out by Mr. Heath, in *boils* and *abscesses*, where the suppurative process may be prevented or even arrested by its use. It is also a good application to inflamed *piles* and *fissure of the rectum*. It is also applied to the skin to check localised sweating, to the breast to arrest the secretion of milk, and to the neighborhood of the eye to dilate the pupil; but its actions here are so intimately associated with the theory of its internal administration, that we will say no more on the subject at present.

Belladonna is very readily absorbed through the unbroken cuticle, and symptoms of poisoning have occasionally been caused by its local application.

INTERNAL ADMINISTRATION.

Physiological Action.

1. *On the Brain.*—After full doses of belladonna, a tendency to delirium sets in, usually of a joyful character, and attended by hallucinations and spectral illusions. Sleep generally follows.

2. *On the Spinal Cord.*—In frogs this action is very decided, for when atropia is injected below the skin the animal is at first paralyzed, lying quite motionless, with

Therapeutical Application.

1. Belladonna may be cautiously used as a hypnotic when other remedies fail.

2. It is used in some spinal affections in accordance with the principles of Dr. Brown-Séquard, explained under another section.

It is also of value in check-

arrested breathing, which period of inaction is suddenly interrupted in about from one to eighteen hours by the occurrence of violent tetanic spasms.

3. Belladonna paralyses the terminal filaments of the third nerve supplied to the circular or sphincter fibres of the iris, and thus allows the sympathetic, which rules over the radiating fibres, to come into unchecked play, and so dilate the pupil. At the same time we observe a diminution in ocular tension and imperfect vision, especially for near objects, due to paralysis of the power of accommodation.

ing the tendency which occasionally exists to nocturnal seminal emissions, when these become of exhausting frequency.

3. Belladonna, used more conveniently in the cleaner form of atropia, is in very extensive use in eye diseases to facilitate ophthalmoscopic examinations, to keep the pupil freely dilated in iritis, and so lessen the risk of adhesion of its free margin to the lens, with subsequent contraction, distortion, and impairment of vision.

It is also used to obviate protrusion of the iris through any hole in the cornea made by ulceration or accident, and it forms a soothing application in various painful affections.

To dilate the pupil the liq. atropiæ [Br., gr. iv. ad f̄j] is now generally used, care being taken only to introduce a very small drop into the eye; for if a larger quantity is applied, the resulting effects and inconveniences may last from a week to ten days, much to the annoyance of the patient. [Although weaker solutions take a little longer time to dilate the pupil and paralyse the accommodation, yet these effects are more transient and therefore more satisfactory to the patient. A gr. $\frac{1}{4}$ solution is strong

enough for ordinary use, and will dilate the pupil in about half an hour after instillation.]

Belladonna being so readily absorbed, however, dilatation of the pupil will ensue on application of the extract or liniment for any length of time to any part of the body.

4. The action of belladonna on the sympathetic nervous system is somewhat irregular, and to this is no doubt due some at least of that action on certain secretions which we shall shortly note more fully. But one symptom often observed, more especially in children, probably proceeds from vaso-motor paralysis, and that is transient flushing and sweating of the face now and then following a dose.

5. The influence of belladonna on the circulation is due to another nervous influence. Under the use of this drug we observe increased rapidity and force of cardiac action, and this is explained by a paralysing action which it exerts on the terminal inhibitory filaments of the pneumogastric nerve distributed to the intimate structure of the heart. It is proved by experiment that the sympathetic nerve supply has the power of causing very rapid action of the heart; but a rein is kept on

5. Belladonna is an excellent cardiac tonic, increasing the regularity and strength of the contractions of the heart.

It is also a very soothing remedy in cases of irritable palpitation, and the old-fashioned belladonna plaster is certainly of use in these conditions.

this, and the proper balance of motive force is sustained by the pneumogastric nerve, which inhibits or restrains the impetuous action of the sympathetic. By paralysing these inhibitory filaments, then, belladonna hands the heart over to the sympathetic, which, without rein or drag, runs riot, and we accordingly find that excessive increase in the heart's rapidity follows the injection of a moderate quantity of atropia.

Coincident with this we get raised arterial tension.

6. Belladonna contracts the small vessels, probably not from nervous influence, but from a direct action upon the unstriped muscular fibres surrounding the arterioles.

7. *On Respiration.*—Belladonna tends to increase the rapidity of the breathing by stimulation of the respiratory centre.

8. It has the power of contracting unstriped muscular fibre in other situations than the arterial tubes. It

6. Dr. Brown-Séquard recommends the use of belladonna in those cases of chronic inflammation of the spine leading to paralysis, where it acts well by contracting the vessels and diminishing the supply of blood to the affected part; and he gives it internally, and applies a plaster along the spine.

To this contracting influence on the small vessels is probably due the effect of belladonna in checking local inflammatory conditions.

7. Atropia has been recommended as an efficient remedy in *asthma*.

8. Belladonna is an excellent remedy for the nocturnal *incontinence of urine* of children; but in order to do

probably does so both in the bladder and intestines.

any good it must be boldly pushed, and I have been obliged to give as much as fʒjss. or even fʒij. of the tincture [Ph. B.] before success was attained.¹

From its tonic influence on the muscular structures of the intestines, it is an excellent adjunct to purgative pill masses, from $\frac{1}{4}$ to $\frac{1}{2}$ grain acting well in combination with colocynth; or, even given alone with ext. gentianæ, it will often secure a regular action of the bowels.

It is also very useful by relieving spasm, as in colic.

Action on Secretion. — 9. *Salivary.* — It checks the salivary secretion, causing a peculiar sensation of dryness in the mouth and throat; and this is believed to be due to a remarkable selective action on the secretory branches supplied from the chorda tympani nerve to the submaxillary ganglion.

10. *Cutaneous.* — Belladonna most effectually arrests the action of the skin, and occasionally under its use a vivid red eruption, not unlike scarlet fever, breaks out.

9. Belladonna has been used to check excessive salivation.

10. It is an excellent remedy for undue *sweating*, whether general, as in phthisis or rheumatism, or local, as about the head of rickety children or the feet of some individuals. It may be either given in the form of succus, extract, or tincture, or better by the subcutaneous injection of atropia.

¹ [The Tincture of Belladonna, U. S., is about $2\frac{1}{2}$ times the strength of the English preparation.]

11. It also checks the secretion of the milk, either locally or by internal use.

11. It is a most valuable remedy in cases where inflammation threatens in a breast, when the child has died or cannot suck, and the gland becomes congested from retention of its secretion. Here the external application of belladonna speedily diminishes the red, tense, shining aspect, relieves the wearing pain, and arrests the milk.

12. On the solid urinary constituents no special action has been noted, but it increases the flow, by raising the tension in the glomeruli of the Malpighian bodies.

12. It may therefore be recommended as a good diuretic.

Belladonna is also used under one or two conditions which cannot accurately be grouped under any specific heading.

Thus it has been vaunted in *whooping-cough*, but after careful and repeated trials with large and small doses, I am compelled to agree with Dr. Kelly that its action in this disease is too uncertain to be of much use. But in certain forms of spasmodic cough, simulating pertussis, or when the cough is merely an occasional loud clanging bark, I have derived much benefit from belladonna. In *epilepsy* and *chorea* it has been tried, but without marked success.

The subcutaneous injection of atropia is said by Dr. Anstie to be of great service in *lumbago*, *sciatica*, and *chronic rheumatism*, and to be the best of all remedies for pain in the pelvic viscera. It has also been recently observed that the addition of a little atropia to the ordinary morphia injection tends to obviate the distressing faintness, pallor and nausea, which occasionally mar the efficacy of the subcutaneous mode of administering this valuable drug. Ringer recommends its use in irritative *dyspepsia*, giving from $\frac{1}{8}$ to $\frac{1}{4}$ gr. of the extract night and morning, and gradually increasing the dose. [A solution

of atropia, 1 in 100, if applied to an exposed nerve-pulp, is said to relieve toothache immediately.]

DRAWBACKS TO THE USE OF BELLADONNA.

Poisonous Symptoms and Antidotes.—Occasionally the use of atropine drops to the eye causes an erysipelatous inflammation about the lids and face, and patients often complain of the disfigurement and inconvenience arising from a widely-dilated pupil. Idiosyncrasy may also here be the source of inconvenience, and we may find persons affected with dryness of the mouth and throat after very small doses. This is always the first indication of the physiological action of belladonna, and is followed by a peculiar sensation of thirst and feverishness, without heightened temperature, rapid pulse and breathing, red tongue; the face then flushes, delirium sets in, with great weakness, very hurried breathing, convulsions, and finally coma, which ends the scene. The antidotes are opium, which, within certain limits, is antagonistic to belladonna, animal charcoal, the fixed alkalis, which destroy its poisonous properties, and Calabar bean, which has recently been shown to be the physiological antidote.

One curious point about belladonna is that, although so poisonous to man, its destructive influence is very various on other animals. The carnivora are much more readily affected by it than the herbivora, many of whom browse on it with impunity. Thus a horse has been known to eat eight pounds of the leaves without injury; blackbirds feed freely on the berries; and 15 grains of atropia are required to poison a rabbit.

DOSE AND MODE OF ADMINISTRATION.

Extractum belladonnæ gr. $\frac{1}{8}$ to gr. j.; tinct. belladonnæ [Br.] $\mathfrak{m}\text{x}$. ad $\mathfrak{f}\mathfrak{z}\mathfrak{i}\mathfrak{j}$.; succus $\mathfrak{m}\text{v}$. to $\mathfrak{f}\mathfrak{z}\mathfrak{ss}$. Atropia is seldom if ever used internally, and $\frac{1}{8}$ gr. would to be a safe medium dose.

It is well to note that children take not only without injury, but with benefit, much larger doses than adults, and, whilst I have seen a woman display well-marked physiological symptoms after a few 10 minim doses, I have often prescribed 20 minims of the [English] tincture for a child of two years without anything of the kind.

BENZOINUM—BENZOIN.

[*A solid balsam obtained from Styrax Benzoïn, U. S.*]

OFFICIAL PREPARATIONS, U. S.

Acidum Benzoicum. (Enters into Tinctura Opii Camphoratæ.) Dose, gr. x.—xxx.**Ammonii Benzoas.** Dose, gr. x.—xxx.**Tinctura Benzoini.** Dose, fʒss.—fʒj.**Tinctura Benzoini Composita.** Dose, fʒj.—ij.**Unguentum Benzoini.** (Adeps Benzoatus, Br.)

LOCAL ACTION.

Physiological.

Tincture of benzoïn is a stimulant to raw surfaces. [Benzoïn has the property of preventing rancidity in ointments, &c., in hot weather.]

Therapeutical.

It is therefore occasionally used as an application to foul or indolent sores.

INTERNAL ACTION.

Benzoïn has the stimulating influence on mucous membranes possessed by most of the gum-balsams. During its passage through the blood it becomes converted into hippuric acid, and increases in some measure the acidity of the urine.

Benzoïn may be prescribed with effect in advanced cases of *bronchitis*, and in some conditions of chronic irritation about the bladder.

It may be conveniently given in the form of the benzoate of ammonia.

R. Tincturæ benzoini compositæ	fʒvj.;
Mucilaginis acaciæ	fʒj.;
Syrupi zingiberis	fʒss.;
Aquæ menthæ piperitæ	fʒvj. M.

S. Capiat unciam unam quartâ quâque horâ.

For advanced *bronchitis*.

[OLEUM BERGAMII—OIL OF BERGAMOT.]

The volatile oil obtained from the fruit of Citrus Limetta (De Candolle), U. S.

Used almost exclusively as a perfume.]

BISMUTHUM—BISMUTH.

[Commercial bismuth of good quality, U. S.]

OFFICIAL PREPARATIONS, U. S.

Bismuthi Subcarbonas. Dose, gr. xv.—xlv.**Bismuthi Subnitras.** Dose, gr. v.—xxx.]

LOCAL ACTION.

Physiological.

Bismuth has no action on the unbroken cuticle, but, applied to a raw or mucous surface, it is sedative and astringent.

Therapeutical.

It is a good application to *intertrigo*, *ulceration about the mouth*, and as an injection in *gonorrhœa* and *leucorrhœa*. It has lately been recommended as a snuff to check *cold in the head*, and the liquor has been praised as an application to *prolapsus ani* (Cleland).

INTERNAL ACTIONS AND USES.

On Digestive Tract.—

Bismuth is sedative to the stomach, and exerts an astringent influence over the intestines, probably in virtue of its local effects.

Bismuth is one of our most valued remedies in many forms of *dyspepsia*, the main indications for its use being pain and vomiting. When a patient suffers acute pain after eating, with or without sickness, the tongue being clean and much flatulence present, we may give bismuth with much confidence, and it is also of service in the vomiting of drunkards, in *pyrosis*, and in many forms of *diarrhœa*, more especially that met with in children.

MODE OF ELIMINATION.

Very little bismuth is absorbed, and it is principally thrown out of the system by the intestines, to whose secre-

tion it imparts a blackish hue, from the formation of a sulphide.

MODE OF ADMINISTRATION, &c.

The subnitrate of bismuth, which is the most effective preparation, may be given simply in powder, either by itself or in combination with charcoal or soda; or it may be given in solution with hydrocyanic acid, gentian, &c., the dose being from 5 to 20 grs., and large doses being preferable.

R. Bismuthi subnitratis ʒij.;
Mucilaginis [acaciæ] fʒj.;
Acidi hydrocyanici diluti ℥x.-xx.;
Infusi gentianæ ad fʒvj. M.
Sumat fʒss. ter die.

R. Liquoris bismuthi et ammoniæ citratis [Br.] fʒiv.;
Syrupi aurantii fʒv.;
Infusi calumbæ fʒv.
Misce. Sumat unciam unam ter in die.

The carbonate and oxide of bismuth are seldom used, but an agreeable preparation, less effectual, however, than the subnitrate, is known as the liquor bismuthi et ammoniæ citratis, which contains gr. iij. of the oxide to the drachm; and lozenges, containing each gr. ij. of the subnitrate, are also included in the [British] Pharmacopœia.

BROMINIUM—BROMINE.

[*A liquid, non-metallic element, obtained from sea-water.*

Dose, gtt. ij.-iij., largely diluted with water.

OFFICINAL PREPARATIONS, U. S.

Ammonii Bromidum. Dose, gr. xx.-xxx.

Potassii Bromidum. Dose, gr. x.-xxx.

ANTIDOTE.

Ammonia, followed by the customary treatment for irritant poisons.]

Bromine has been used as a lotion by Dr. Routh and others.

Bromine in a free state being never used [to any extent] in medicine, we shall consider its properties under Bromide of Potassium.

[Bromine is a valuable caustic, and is sometimes used

in gynecology as an application to the uterus. It is said that its mixture with glycerine is liable to explode. It is useful in hospital gangrene both as a caustic, and in dilute solution as an antiseptic wash. Used internally, it resembles iodine in its effects as an alterant.]

BUCHU—BUCHU.

[*The leaves of Barosma Crenata and other species of Barosma, U. S.*

OFFICINAL PREPARATIONS, U. S.

Extractum Buchu Fluidum. Dose, fʒss.-j.

Infusum Buchu (fʒj. to Oj.). Dose, fʒj.-ij.]

Physiological Action.

The physiological action of buchu is principally if not entirely expended on the mucous membrane of the genito-urinary organs. It is probable that the volatile oil which it contains, being rapidly taken into the blood and as rapidly excreted by the kidneys, acts locally through the urine on the lining membrane of the bladder and urethra. [It is also, to some extent, diaphoretic.]

The urine is impregnated with the peculiar odor of the drug, and is perhaps slightly increased in quantity.

Therapeutical.

Buchu has long been valued by surgeons as a useful remedy in *chronic catarrh of the bladder* and the various mucous discharges from the genito-urinary organs depending on a relaxed condition of the affected parts. [It is largely employed in the treatment of subacute or chronic gonorrhœa, resembling turpentine in its effects, although far less stimulating. In incontinence or retention of urine, depending upon want of tone in the bladder, it is a most useful agent.]

CADMIUM—CADMIUM.

[OFFICINAL PREPARATION.

Cadmii Sulphas. Used externally.

The sulphate of cadmium strongly resembles the corresponding zinc salt in its properties, and is occasionally employed as an astringent collyrium (gr. i.-iv. to rose-water fʒj.). The iodide of cadmium is officinal in the British Pharmacopœia, but] is only used in the form of unguentum cadmii iodidi [Br. gr. lxij. to ʒj.] in some

cases of skin disease [making an admirable substitute for the iodide of lead].

CAFFEA—COFFEE.

[*The seed of Caffe Arabica, U. S.*]

Tea, coffee, guarana, and coca, substances containing the same alkaloid, caffeine, have much the same effect.

CAFFEINE

is a very active substance, causing at first increase, but later diminution, of the reflex functions of the cord, with nervous convulsions and muscular rigidity, the motor nerves not being affected. The heart's action is first accelerated, but afterwards retarded. The excretion of urea is lessened. The frequent and prolonged use of tea and coffee causes, in some persons, a variety of nervous sensations, sleeplessness, numbness, and tingling of the extremities, with irritability of the heart; and there is no doubt that much loss of appetite and flatulent dyspepsia originate in the habit of drinking tea shortly before or after meals. The invigorating and restorative effects of tea and coffee are well known, and valued by persons undergoing much bodily fatigue. The therapeutic indications for tea and coffee are almost restricted to the administration of the latter substance in cases of *opium-poisoning*.

Guarana in 20-grain doses has been found a useful remedy for *migraine* or sick headache, and the chewed leaves of the coca plant have been highly recommended by Sir R. Christison and others as a nervine and muscular stimulant. Although the respected Baronet found great benefit from this plant during severe exertion, Weston, the well-known pedestrian, gives his opinion as tending quite to the opposite conclusion.

[OLEUM CAJUPUTI—OIL OF CAJUPUT.

The volatile oil obtained from the leaves of Melaleuca Cajuputi (Roxburgh, Trans. Lond. Medico-Botan. Socy.), U. S.

Cajuput oil is highly-prized in the East Indies as a stimulant carminative. The ordinary dose is gtt. ij.—v., but it has been given with great success in the collapse of cholera, in doses of gtt. xv. to fʒj. It is also used as a rubefacient counter-irritant, diluted with olive oil. Like

other oils of this class, it relieves toothache when introduced into a carious tooth.]

CALCIUM—CALCIUM.

[**Calcii Chloridum**—Chloride of calcium prepared by fusion, U. S.

Calcii Hypophosphis—Hypophosphite of lime. Dose, gr. x.-xxx.

Calx—Lime recently prepared by calcination, U. S.

Calx Chlorinata—A compound resulting from the action of chlorine on the hydrate of calcium and containing at least 25 per cent. of chlorine, U. S.

OFFICINAL PREPARATIONS, U. S.

Calcis Hydras. Used in pharmacy.

Calcii Carbonas Præcipitata. Dose, gr. xx.-3j.

Calcii Phosphas Præcipitata. Dose, gr. x.-xxx.

Creta Præparata. Dose, gr. x.-xv.

Hydrargyrum cum Creta (mercury 3 pts., chalk 5 pts.). Dose, gr. v.-xxx.

Trochisci Cretæ.

Mistura Cretæ. Dose, f3ss.

Testa Præparata. Dose, gr. x.-xv.

Liquor Calcii Chloridi. Dose, f3ss.-j.

Liquor Calcis (lime-water). Dose, f3j.-iv.

Linimentum Calcis (lime-water f3vij., linseed oil f3vij.).

Potassa cum Calce. Used as a caustic.

Also used in the preparation of *Æther Fortior*, *Ammonii Valerianas*, *Aqua Ammonia*, *Liquor Potassæ*, *Liquor Sodæ*, *Liquor Sodæ Chlorinata*, *Quiniæ Sulphas*, *Santoninum*, *Spiritus Ammonia*, *Strychnia*, and *Sulphur Præcipitatum*.]

LOCAL ACTION.

Physiological.

Some of the preparations of lime, used externally, are sedative or soothing; others are astringent.

Therapeutical.

Lime is used as a soothing application to burns, as in the *linimentum calcis*; and lime-water makes a good injection for *leucorrhæa*, or enema for the destruction of *thread-worms*.

INTERNAL USES.

Lime, taken internally, neutralises acid secretions, and has astringent properties.

It is therefore used with benefit in some forms of *dyspepsia* and in *diarrhæa*, liquor calcis being the most generally employed preparation. Lime-water is also of great service in preventing the curdling which often causes milk to disagree with patients of weak digestion.

Chalk is more astringent than lime, and is an excellent remedy, either alone or in combination with opium, for *diarrhæa*.

Chloride of calcium has been highly praised in 20-grain doses as a remedy for various forms of *scrofula*. [The dose of chloride of lime (*calx chlorinata*) is gr. j.-v., but it is rarely prescribed, being principally used as a disinfectant.]

Phosphate of lime has been highly praised by Ringer in doses of from 1 to 2 grs. in *rickets*, where it acts by improving the general nutrition of the system, and supplying structural elements in which the growing bones of badly nourished children are often deficient. [The hypophosphite of lime has been highly recommended in consumption.]

 CALUMBA—COLUMBO.

[*The root of Jateorrhiza palmata* (Miers), *Cocculus palmatus* (De Candolle); and *Jateorrhiza Calumba* (Miers), *Cocculus palmatus* (Wallich Catal. non D. C.), U. S.]

OFFICIAL PREPARATIONS, U. S.

Extractum Calumbæ Fluidum. Dose, ℥ xv.-xxx.

Infusum Calumbæ (root f℥ss. to Oj.). Dose, f℥j.-ij.

Tinctura Calumbæ (root ℥ij. to Oj.). Dose, f℥j.-ij.]

LOCAL ACTION.

Calumba has no local action.

CONSTITUTIONAL ACTION.

*Physiological.**Therapeutical.*

On the Digestive Functions.—Like all bitter tonics, calumba stimulates the appe-

Calumba is a good tonic in deficient appetite from indigestion or simple want of

tite, and increases slightly the secretion of saliva and the gastric juice. It is lighter and more agreeable than some others of the class, and has been believed to have sedative properties, in virtue of which it may be beneficially given in sickness and vomiting; but of this we have been unable to obtain reliable evidence.

tone, in various dyspeptic conditions, and in most enfeebled states of the constitution, from whatever cause they may arise. [As it does not contain tannic acid, it may be given in combination with iron.]

MODE OF ADMINISTRATION.

Calumba is usually given in combination either with iron, with alkalies, or with other tonics. Thus:—

- R.** [Ferri et potassii tartratis] ʒjss;
 Potassii bicarbonatis ʒij.;
 Syrupi hemidesmi [Br.] fʒj.;
 Infusi calumbæ fʒviij.
 Misce, fiat mistura. Capiat unciam unam bis in die.
- R.** Pulveris calumbæ gr. x.;
 Sodii bicarb. gr. xx.;
 Pulv. rhei gr. v.;
 Pulv. zingiberis gr. x.
- M.** Fiat pulvis bis in die sumendus ante cibum.

A useful powder in some forms of dyspepsia.

CAMPHORA—CAMPHOR.

[*A peculiar, concrete substance, derived from Camphora officinarum, and purified by sublimation, U. S.*]

Oleum Camphoræ (Oil of Camphor). Dose, gtt. ij.–iiij.

OFFICINAL PREPARATIONS, U. S.

Aqua Camphoræ (ʒj. to Oj.). Dose, fʒss–ij.

Linimentum Camphoræ (camphor 1 pt., olive oil 6 pts.).

Linimentum Saponis.

Mistura Chloroformi (chloroform fʒss., camphor ʒj. in fʒvj.).

Spiritus Camphoræ (ʒij. to Oj.). Dose, fʒss.–j.

Tinctura Opii Camphorata (Paregoric). Dose, fʒss.

Ceratum Plumbi Subacetatis (Goulard's Cerate).

ANTIDOTES.

Opium and stimulants.]

LOCAL EFFECTS.

Physiological.

Camphor has some rubefacient properties, reddening and irritating the skin.

Therapeutical.

Camphor forms an ingredient of most of the liniments in common use.

INTERNAL ACTION.

1. *Brain and Nervous System.*—Camphor in large doses causes a good deal of giddiness and confusion of ideas, even amounting in some cases to delirium.

Muscular weakness is at first observed, but this rapidly gives way to violent epileptiform convulsions and almost maniacal excitement. In frogs, well-marked lowering of the reflex irritability of the spinal cord has been observed.

2. *Circulation.*—In small doses camphor seems to stimulate the heart's action, but after the administration of larger quantities great cardiac prostration has been observed by Dr. Geo. Johnson and others.

1. Camphor is not used [in large doses] on account of its action on the nervous system, and the results of the few experimenters who have been bold enough to try the effects of large doses on themselves have not been of a very encouraging nature. [It is moderately stimulating and diaphoretic, and possesses undoubted anodyne and narcotic influence. In the spasmodic and nervous complaints of women camphor is extensively employed.]

2. Camphor has been found of service in the early stages of *coryza*, but must be here used with caution, as the homœopathic tincture, which is generally prescribed [outside of the regular profession], is now known to be a very strong preparation, and Dr. Geo. Johnson and others have described cases in which excessive weakness and faintness, with great cardiac and muscular prostration, followed doses of from 15 to

20 minims [and several fatal cases of poisoning by it have been reported].

3. *Respiration and Temperature*.—No influence on the respiration is noted, but there is a marked lowering of temperature.

4. *Digestive and Secreting Organs*.—In large doses, some irritation of the gastrointestinal mucous membrane has been observed, with diarrhœsis, and the sexual appetite seems to be diminished.

4. Camphor is said to be a good remedy in summer diarrhœa.

It is a popular antidote to *chordee*.

[CANELLA—CANELLA.

The bark of Canella alba, U. S.

OFFICIAL PREPARATIONS, U. S.

Pulvis Aloes et Canellæ. Dose, gr. x.—xx.

Vinum Rhei (rhubarb ʒij., canella ʒj. to Oj.). Dose, fʒj.—iv.

USES.

Canella is an aromatic tonic, but is rarely prescribed alone. It contains no tannin, and may be given with a chalybeate. The powder of aloes and canella is a popular remedy for *amenorrhœa* under the title of *Hiera Picra*.]

[CANNA—CANNA.

The secula from the rhizome of an undetermined species of Canna, U. S.

Canna-starch may be used like arrowroot as a bland nourishment for invalids.]

[CANNABIS AMERICANA—AMERICAN HEMP.

The flowering tops of Cannabis Sativa, cultivated in North America, U. S.

OFFICIAL PREPARATION, U. S.

Extractum Cannabis Americanæ. Dose, gr. $\frac{1}{4}$ to $\frac{1}{2}$.]

CANNABIS INDICA—INDIAN HEMP.

[*The flowering tops of the female plant of Cannabis Sativa, variety Indica, U. S.*

OFFICIAL PREPARATIONS, U. S.

Extractum Cannabis Indicæ. Dose, gr. $\frac{1}{2}$.

Tinctura Cannabis (gr. iij. ad f3j.). Dose, gtt. x.—xx.]

LOCAL ACTION.

Indian hemp is never used locally.

INTERNAL ACTIONS.

Physiological.

I. On Brain and Nervous System.—Indian hemp, like opium, possesses a double exciting and sedative action, the brain being stimulated into pleasant exhilaration before sleep sets in. This preliminary effect, however, is more powerful and lasting than in the case of opium, and the subsequent condition of slumber is usually disturbed by dreams and spectral illusions. Various authors have given graphic descriptions of the intellectual disturbance produced by this drug, dwelling more especially on a peculiar feeling of double consciousness, leading on, in some cases, to partial catalepsy.

We also find indications of some special affection of the sensory nerves, a marked degree of numbness and tingling, ushering in cutaneous anæsthesia and diminution of the muscular sense.

Therapeutical.

I. Indian hemp may be used as a narcotic when other remedies fail; but its action is so uncertain and irregular, and the difficulty of procuring reliable preparations so great, that our present knowledge does not enable us to lay down any practical rules for its employment. Dr. Clouston, however, has obtained valuable assistance in *acute mania* by prescribing the tincture in combination with bromide of potassium. Although later experience has not confirmed the pretensions of those who formerly vaunted Indian hemp as a cure for *hydrophobia, chorea, tetanus*, and allied nervous ailments, we may sometimes produce good results in *neuralgia* and *migraine* by its cautious use.

2. *Circulation.* — Some increased rapidity of pulse has been observed during the action of Indian hemp; but it is probable that this is only due to the condition of nervous excitement which we have just described.

3. *Digestive System.* — No special effect seems to be produced on the stomach or intestinal canal, and the absence of constipation following its use gives Indian hemp one advantage over opium.

DOSE AND MODE OF ADMINISTRATION.

R. Tincturæ cannabis Indicæ f ℥j. ;
 Mucilaginis acaciæ f ℥j. ;
 Syrupi zingiberis f ℥ss. ;
 Aquæ menthæ piperitæ ad f ℥vj.
 Misce, fiat mistura. Capiat unciam unam quartâ quâque horâ.

In *neuralgia*, &c.

CANTHARIS—CANTHARIDES.

[*Cantharis vesicatoria*, *Lytta vesicatoria* (*Fabricius*), *U. S.*

OFFICIAL PREPARATIONS, *U. S.*

Tinctura Cantharidis. Dose, ℥iij.—v.
Ceratum Cantharidis. (For spreading blisters.)
Ceratum Extracti Cantharidis.
Charta Cantharidis. (Blistering papers.)¹
Collodium cum Cantharide.
Linimentum Cantharidis.
Emplastrum Picis cum Cantharide.
Unguentum Cantharidis (℥ij. in ℥j.).

ANTIDOTE.

There is no antidote for cantharides.]

¹ [Charta Cantharidis and Charta Sinapis form the class of **Chartæ**, *U. S. P.*]

EXTERNAL ACTIONS.

Physiological.

The first effect of the application of cantharides to the skin is tingling and smarting, speedily followed by vivid redness and severe burning pain. To this succeeds the formation of large blebs containing a watery fluid rich in albumen and fibrine; and if the blister be allowed to remain for any lengthened period in contact with the skin, ulceration and sloughing may supervene. It has been found that the moderate counter-irritant action of cantharides causes the copious exudation of white blood-corpuscles into the subcutaneous areolar tissue, with engorgement of the more superficial structures underlying the skin, whilst the deeper strata look pale, anæmic, and flabby; the lungs even being affected in this way. It has also been shown that the irritant action of cantharides may penetrate through the skin, and cause redness and inflammation of the pleura and peritoneum. The first constitutional effect of a blister is a slight elevation and subsequent depression of the temperature, with weakening of the action of the heart.

It not uncommonly hap-

Therapeutical.

Blisters are used to fulfil the following indications:—

1. To relieve pain. There can be no doubt that blisters frequently check pain most effectually, as in *subacute pleurisy*, *pleurodynia*, *gastroalgia*, *sciatica*, and *neuralgia*, it being important that in this last-named affection the counter-irritant should be placed as near as possible to the root of the affected nerve.

2. To check inflammatory conditions. There is no doubt that some local inflammations may be checked by blistering a neighboring vascular area. Thus, in *iritis* and some other inflammatory affections of the eye, benefit may be procured in this way; and in acute *rheumatism* blisters applied immediately above the inflamed joints rapidly remove pain and swelling.

On this principle, also, Mr. F. Jordan recommends his iodine treatment of localised surgical affections already referred to.

In how far inflammations of internal organs may thus be treated with advantage is a somewhat open question; for although the withdrawal of blood from the deeper structures might theoretic-

pens that cantharides may be absorbed through the skin, and cause kidney irritation.

cally, be considered beneficial, it is practically found that the pain and annoyance of blisters add to the feverish discomfort of the victims of acute disorders.

3. To promote absorption. Blisters are supposed to aid the absorption of effused products, fluid or solid, and are therefore much used in *thoracic dropsy*, either pleural or pericardial, the latter stages of *pneumonia*, *chronic joint-disease*, &c.

4. To stimulate and alter vascular or nervous functions, &c. Blisters may be employed to rouse patients from the stupor of *typhus*, or *narcotic poisoning*, or various *brain affections*, to check obstinate vomiting, and under various other conditions laid down in works on practical medicine.

INTERNAL ACTIONS.

Physiological.

Cantharides is a gastrointestinal irritant, and also a renal irritant and diuretic, causing an increased flow of urine, but frequently giving rise to a good deal of strangury, with painful, frequent, and difficult micturition, and bloody urine. This irritation may spread by sympathy to other allied organs, and uterine excitement on the one side, or excess of venereal appetite

Therapeutical.

Cantharides is not much used internally, on account of its irritating properties. It is, however, occasionally prescribed in *pyelitis* and some chronic affections of the kidney, and in chronic diseases of the spine.

Some authorities also have praised it highly in *psoriasis*. It has also been used for the purpose of procuring abortion, and it possesses emmenagogue properties.

with chordee and seminal emissions on the other, may follow the administration of large doses.¹

CAUTIONS. MODE OF ADMINISTRATION.

We must use blisters with caution under the following circumstances:—

In the aged, infirm, or very young, where troublesome ulceration is apt to ensue.

In acute inflammatory conditions, and more especially those of the kidney.

To cicatricial tissue, or to parts deprived of some of their vitality by the withdrawal of nervous influence, as in paraplegia.

Blisters are usually kept on from ten to twenty hours, but we may well limit the period to six or eight hours, and develop the blebs by a subsequent poultice. When the desired effect has been produced, let out the watery fluid, and apply a thick layer of cotton-wool.

CAPSICUM—CAPSICUM.

[*Syn. Cayenne and African Pepper.*

The fruit of Capsicum annuum, Capsicum fastigiatum (Blum), and other species of Capsicum, U. S.

OFFICIAL PREPARATIONS, U. S.

Infusum Capsici. Dose, f℥ss.

Oleo-Resina Capsici. Dose, gtt. j.

Tinctura Capsici. Dose, f℥j.-ij.]

This is a topical stimulant to the mucous membranes, exciting the appetite in small doses, but in larger quantities causing gastro-enteritis. In some forms of sore throat, as in the early stage of *tonsillitis*, or in simple relaxation of the mucous membrane, it forms a useful addition to a gargle [as infusum capsici].

Recently it has been highly praised by Dr. Lyons, of

¹ [The tincture of cantharides, U. S. P., is more than twice the strength of the English preparation.]

Dublin, in ten-minim doses of the tincture before meals, for the relief of the nausea, depression, and drink-craving of confirmed dipsomaniacs.

R. Tincturæ capsici	℥x.;
Tincturæ nucis vomicæ	℥x.;
Acidi nitrici diluti	℥xx.;
Aquæ	ad f ʒj.

Fiat haustus ter die sumendus.

Useful in drink-craving.

CARBO—CARBON.

[*Carbo Animalis*—Charcoal prepared from bone, U. S.

Used in preparing Cinchoninæ Sulphas, Morphia, Quininæ Sulphas, and Santoninum.

Carbo Ligni—Charcoal prepared from wood, U. S.

Used in preparing Acidum Sulphurosum and Potassii Iodidum.

OFFICIAL PREPARATION.

Carbo Animalis Purificatus.

Used in making Acidum Gallicum, Digitalinum, Strychnia, and Veratria.]

LOCAL ACTIONS.

Physiological.

Charcoal has no purely local action on any tissue with which it is brought in contact, and as it is quite insoluble it can exert no general influence on the functions of the body. It is therefore simply a mechanical agent, and acts in virtue of the following properties.

1. It not only freely absorbs gases within its pores, but oxidises and destroys those of an offensive and injurious nature, as sulphuretted hydrogen; and further, it also deodorises, by oxidation, and destroys or-

Therapeutical.

1. In virtue of its absorbing powers, charcoal is used in many of those cases of *dyspepsia* where large quantities of gas are formed by premature decomposition of the food, and where much pain, nausea, and want of appetite are experienced by the patient. In *consumption* and many chronic stomach disorders charcoal acts well by relieving the *flatulence* which is often the chief discomfort of the sufferer. Charcoal is also an excellent deodoriser and antiseptic, and is used for these purposes in the

ganic impurities of all kinds, decolorising solutions which contain them.

construction of filters, contact for four months being sufficient to purify the foulest and most deeply stained waters; and if the organic matter present does not exceed from 1 to 2 grains per gallon the charcoal will permanently retain its cleansing properties. It may also be of great service in absorbing and destroying offensive effluvia in the neighborhood of sewers or drains, and it used to be a fashionable application to unhealthy *ulcers*; but cleaner and equally effectual antiseptics have now entirely displaced it from popular favor.

It is also occasionally employed in the formation of respirators and as an adjunct to tooth powders, and Dr. Thorowgood advises its prescription in teaspoonful doses in *bleeding piles*.

2. Animal charcoal possesses the power of rendering various vegetable poisons inert by placing them in a form of combination beyond the absorptive powers of the stomach.

2. If we are called very early to a case of *poisoning* by *opium*, *aconite*, *strychnia*, or other vegetable poison, we may hope to do some good by charcoal, provided that absorption of the poisonous agent has not yet taken place to any extent.

MODE OF ADMINISTRATION.

As a medicinal agent vegetable charcoal alone is used, and may be given in doses of from a tea- to a table-spoonful, great care being taken to insure perfect freshness, as its absorptive powers are seriously impaired by keeping. It may be combined effectively with bismuth, or given in

sandwich form between bread and butter, or moistened with spirit in a wineglass before suspension by water; but in any case its unsightly appearance, gritty consistence, and insolubility interfere with its prescription in elegant form, and we may advise our patients with advantage to make use of Bragg's biscuits or Belloc's lozenges.

As an antidote, animal charcoal must be given in considerable doses, as it is calculated that half an ounce is required to neutralise one grain of vegetable alkaloid. As an antiseptic it may be placed in shallow pans close to the outlet of drain or sewer ventilating shaft.

CARDAMOMUM—CARDAMOM.

[*The fruit of Elellaria Cardamomum, U. S.*

OFFICIAL PREPARATIONS, U. S.

Extractum Colocynthis Compositum. Dose, gr.

v.—xxx.

Pulvis Aromaticus. Dose, gr. x.—xxx.

Tinctura Cardamomi. Dose, f ʒj.—ij.

Tinctura Cardamomi Composita. Dose, f ʒj.—iv.

Tinctura Gentianæ Composita. Dose, f ʒj.—ij.

Tinctura Rhei. Dose, f ʒj.—iv.

Vinum Aloes. Dose, f ʒj.—f ʒj.]

This is an agreeable stimulant and flavoring adjunct.

[CARUM—CARAWAY.

The fruit of Carum Carui, U. S.

OFFICIAL PREPARATIONS, U. S.

Oleum Cari. Dose, gtt. j.—x.

Tinctura Cardamomi Composita. Dose, f ʒj.—f ʒss.

Caraway is an agreeable aromatic, used as a stomachic, or to prevent the griping of other medicines. The oil is most frequently employed, but an infusion may be made containing ʒij. to Oj.]

CARYOPHYLLUS—CLOVES.

[*The unexpanded flowers of Caryophyllus Aromaticus, U. S.*

OFFICIAL PREPARATIONS, U. S.

Infusum Caryophylli (3ij. to Oj.). Dose, f 3ij.

Oleum Caryophylli. Dose, gtt. ij.—vj.

Spiritus Lavandulæ Compositus. Dose, f 3j.—ij.

Syrupus Rhei Aromaticus. For infants, f 3j.

Vinum Opii. Dose, gtt. xv.—xxx.

Cloves are a stimulating stomachic, and may be given in substance in doses of gr. v.—x.] Cloves, pimento, and oil of cajuput are carminative and perhaps antispasmodic, and may be useful in *flatulent colic, hysteria, &c.*, more especially as adjuncts to other remedies.

CASCARILLA—CASCARILLA.

[*The bark of Croton Eluteria, U. S.*

OFFICIAL PREPARATION, U. S.

Infusum Cascarillæ. Dose, f 3ij.]

Cascarilla is a light and agreeable tonic.

[CASSIA FISTULA—PURGING CASSIA.

The fruit of Cassia Fistula, U. S.

Cassia pulp is laxative in doses of one or two drachms, but is rarely used except in the official combination, *Confectio Sennæ*, which is a favorite remedy against constipation in pregnancy. Dose, 3j.—ij.]

CASSIA MARILANDICA—AMERICAN SENNA.

[*The leaflets of Cassia Marilandica, U. S.*

This is a competent substitute for the imported senna as a cathartic, but must be administered in rather larger doses. It is much used in the form of infusion, combined with fennel or some other aromatic to prevent griping.]

CASTOREUM—CASTOR.

[*A peculiar concrete substance obtained from Castor Fiber, U. S.*

OFFICIAL PREPARATION, U. S.

Tinctura Castorei. Dose, f 3ss.—ij.]

Castoreum and musk possess much the same properties, the only difference being in the greater strength of the latter. They are stimulant and antispasmodic; but castoreum is rarely if ever used, and even musk, which was formerly much valued in France, and by Graves of Dublin, in typhus, pneumonia, and other diseases tending to assume an adynamic type, has now also fallen into comparative disuse.

[CATARIA—CATNEP.

The leaves and tops of Nepeta Cataria, U. S.

Infusion of catnep (catnep tea) is a favorite remedy for *flatulent colic* in infants, but is rarely used for any other purpose in regular practice, although a hot infusion is a domestic remedy for *amenorrhœa* and *hysteria*.]

CATECHU—CATECHU.

An extract prepared principally from the wood of Acacia Catechu, U. S.

OFFICINAL PREPARATIONS, U. S.

Infusum Catechu Compositum. Dose, f℥j.—iij.

Tinctura Catechu. Dose, f℥j.—iij.

INTERNAL EFFECTS.

Physiological.

Catechu has powerful astringent properties.

Therapeutical.

It is a much-used drug in the relaxed conditions of various mucous membranes, but more especially in *diarrhœa*, and it constitutes an essential ingredient in the mixtures generally prescribed for the relief of that condition.

R. Tincturæ catechu	f℥vj.;
Pulveris cretæ aromatici [Br.]	ʒij;
Tincturæ opii	f℥ij.;
Mucilaginis	f℥i.;
Aquæ cinnamomi	ad f℥vj.
Misce, fiat mistura, cujus sumat semunciam post singulas dejectiones liquidas.	

CERUM—WAX.

[**Cera Alba.** Yellow wax bleached, U. S.

Cera Flava. A peculiar concrete substance prepared by *Apis mellifica*, U. S.

Wax is a good excipient, and is the basis of the cerates. It also enters into pills, ointments, plasters, and suppositories. It is an ancient remedy for *dysentery*.

CERATA.

List of Cerates officinal in the U. S. Pharmacopœia:—

Ceratum (formerly Ceratum adipis).	Ceratum Resinæ.
Ceratum Cantharidis.	“ Resinæ Compositum.
“ Cetacei.	“ Sabinæ.
“ Extracti Cantharidis.	“ Saponis.
“ Plumbi Subacetatis.	“ Zinci Carbonatis.]

CERIUM—CERIUM.

[**Cerii Oxalas**—Oxalate of Cerium.]

The oxalate of cerium, in doses of from gr. j. to gr. ij., is a popular remedy in the *vomiting of pregnancy*, its mode of action being quite unexplained, and its success being, according to my own experience, greatly exaggerated.

It is generally prescribed in the form of pill.

R. Cerii oxalatis gr. xxiv.;
Extracti gentianæ gr. xxxvj.

Misce, fiant pilulæ duodecim, quarum capiat unam bis in die.

[Disappointment from the use of this drug may be explained by the fact that the commercial oxalate of cerium often contains salts of lanthanum, didymium, and other impurities. The chemically pure oxalate of cerium is probably one of the most efficient remedies against the vomiting of pregnancy that we possess; given in powder, in pill, or suspended in mucilage.]

CETACEUM—SPERMACETI.

[*A peculiar concrete substance obtained from Physter macrocephalus, U. S.*

OFFICIAL PREPARATIONS, U. S.

Ceratum Cetacei, Charta Cantharidis, Unguentum Aquæ Rosæ.]

Requires no special notice. [Its internal use has been generally abandoned. The ointment, a perfectly bland preparation, may be used as a dressing to blistered surfaces. The unguentum aquæ rosæ, or cold cream as it is called, is much used for chapped hands and lips, and excoriated surfaces.]

CETRARIA—ICELAND MOSS.

[*Cetraria Islandica* (Acharius, *Lichen Univ.*), U. S.]

OFFICINAL PREPARATION, U. S.

Decoctum Cetrariæ. Dose, fʒss.–iv.]

This plant is supposed to have nutritious properties [and formerly enjoyed a great reputation as a demulcent and tonic in *pulmonary affections*].

[CHENOPODIUM—WORMSEED.

The fruit of Chenopodium Anthelminticum, U. S.]

Dose, in substance, gr. xx.–xl.

OFFICINAL PREPARATION.

Oleum Chenopodii. Dose for a child, gtt. v.–x.

INTERNAL EFFECTS.

A popular remedy against lumbricoid worms. It may be given night and morning for two or three days, then to be followed by a brisk cathartic.]

[CHIMAPHILA—PIPSISSEWA.

The leaves of Chimaphila umbellata (Pursh, *Flor. Amer. Sept.*), U. S.]

OFFICINAL PREPARATIONS, U. S.

Decoctum Chimaphilæ. Dose, fʒij.–iv.

Extractum Chimaphilæ Fluidum. Dose, ʒxx.–xl.

Wintergreen is an Indian remedy for *scrofula*, *rheumatism*, and *nephritic affections*, and it enjoys some reputation as an alterative in regular practice, and has been recommended as a diuretic in *dropsy*. It is also tonic and astringent.]

[CHIRETTA—CHIRETTA.

The herb and root of Agathotes Chirayta, U. S.

Not much used in this country. See note under Gentian.]

CHLORAL—CHLORAL.

[*Syn. Hydrate of Chloral, U. S.*

TREATMENT OF POISONING.

There is no direct antidote for chloral, but the treatment must be conducted on general principles for narcotic poisoning, by evacuants, counter-irritants, stimulants, and maintaining bodily heat.]

LOCAL ACTIONS.

Physiological.

When applied externally, chloral has been by some authorities supposed to have sedative properties, and it is also an undoubted antiseptic.

Therapeutical.

It has been recommended as an external application in *neuralgia*, *rheumatism*, and other painful affections.

Used as a dressing to ulcerated surfaces, it seems to act well by removing the fœtor of discharges and lessening pain; and it has been successfully employed, in solution, for the preservation of anatomical preparations.

CONSTITUTIONAL ACTIONS.

I. Nervous System.—I. Brain.—Chloral [acts as a sedative to the nervous centres and secondarily to the heart. In small doses it probably] produces an anæmic condition of the brain, and thus causes sleep by imitating the natural anatomical

I. Chloral is an excellent hypnotic, causing sound and refreshing sleep, without the digestive disturbance which usually follows the use of opium. It may be given in simple *insomnia* from mental worry, overwork, or other causes, and it is a remedy of

arrangement of that process. The resulting slumber begins very quickly after the dose is swallowed, it is usually sound and dreamless, and the patient wakes in seven or eight hours, well refreshed, and without any marked feelings of *malaise* or digestive disturbance. Exceptions to this, however, have been observed, and in these chloral has caused preliminary excitement; but it is more than probable that an explanation may be found in the use of the impure specimens of the drug too often retailed. Liebreich believes that chloral exerts its hypnotic influence by undergoing transformation in the blood into chloroform and formic acid; but this is improbable for the following reasons:—

(1) The alkali of the blood is too feeble to liberate the chloroform, and the albumen is considered antagonistic to such a process.

(2) No smell of chloroform can be observed in the breath, and no anæsthetic effect is produced on the sleeper by moderate doses.

2. *Spinal Cord*.—The reflex irritability of the spinal cord is very decidedly lessened, and the respiratory centre becomes weakened, and eventually paralysed.

great value in all diseases in which dangerous depression is apt to follow the continuous want of sleep. Thus, in *typhus*, in *delirium tremens*, where it must be pushed boldly in conjunction with an absolute suspension of all alcohol, in *phthisis*, *acute mania*, &c., we may prescribe it with much confidence of success. It has also been recommended in France as an anæsthetic by subcutaneous [intravenous] injection; from 2 to 4 drachms, thus made to enter the veins, being there supposed to yield chloroform, which then exerts its usual influence. There is no reason, however, to believe that anæsthesia thus produced is in any degree safer than the old mode of inhalation; and as the patient is thus exposed to the additional risks of thrombosis, inflammation of the veins, and the entrance of air, one cannot wonder that this process has found no favor in this country.

2. Chloral is of service in some spasmodic diseases, as *chorea*, *whooping-cough*, *asthma*, *incontinence of urine*, *labor after-pains*, &c. It is also undoubtedly useful in [*trismus nascentium*, *puer-*

peral convulsions, and] cases of *tetanus*, several of which have recovered during its administration, and it may also be given as an antidote to strychnia.

3. *Sympathetic and general Nervous System*.—The vaso-motor system is enfeebled, but no special effect seems to be produced on other nervous structures, unless we believe a part of the loss of muscular power, sometimes observed in those who have taken chloral for some time, to be due to an action on the motor nerves.

II. *Circulatory System*.—Chloral has a powerful action on the heart, lowering and weakening its action by paralysing its contained sympathetic ganglia. That this effect is not produced through the medium of the vagi is shown by the fact that it comes on even after these nerves are cut, and their terminal cardiac filaments paralysed by atropine. Along with this slowing of the pulse we get lessened arterial tension from dilatation of the superficial vessels. [Professor Wood¹ states that it would seem most probable that the chloral influences the heart through the centres at the base of the brain.]

3. Chloral, having no influence over sensory nerves, has no power, *per se*, of allaying pain, and is therefore useless in that class of cases where opium is of such signal service.

II. Chloral, weakening cardiac action, must not be given where we have any reason to suspect an enfeebled state of the heart muscle.

¹ [Therapeutics and Materia Medica, 2d ed., Phila. 1877, p. 321.]

III. *Respiration and Temperature.* — The breathing tends to become slower, and finally to cease, from paralysis of the respiratory centre; but urgent dyspnoea has occasionally been observed, and this has been ascribed to dilatation of the pulmonary vessels, causing an increased afflux of blood to be directed suddenly to the lungs.

The temperature falls, and this is no doubt due to surface evaporation produced by the dilated cutaneous vessels.

IV. *Secreting and Digestive Systems.* — No special influence is produced on any of these, but occasionally vomiting and purging have followed the use of chloral.

III. This effect on the respiratory centre naturally suggests caution in prescribing chloral in cases of advanced *bronchitis* with rapidly accumulating mucus secretion and deficient oxygenation of the blood.

ABSORPTION AND MODE OF ELIMINATION.

Chloral is rapidly absorbed by the blood, and given out probably by the urine.

Poisonous Effects.

Chloral may kill by cardiac syncope, and, as this effect has been known to follow a single dose of 30 grains, considerable caution must be exercised in its use; or again, death may ensue from paralysis of the respiratory centre, with coma and gradual suffocation; and, finally, a series of cases has been recorded in which

Antidotes.

Here our efforts must first be directed to obviating the tendency to death. We must endeavor to restore the heart's action by warmth and stimulants; promote breathing by irritation of the surface, galvanism, and artificial respiration; counteract the rapidly-lowering temperature, on which so much danger depends, by warmth;

symptoms arose akin to blood poisoning, with purpuric and scorbutic eruptions, ulceration of gums, and great prostration, ending in death. and finally employ physiological antidotes, such as atropia and strychnia.

CAUTIONS, MODE OF ADMINISTRATION, DOSE, &c.

[It is recommended that re-crystallized chloral should only be prescribed, as the commercial article is liable to be contaminated with impurities, and the results of decomposition.]

The use of chloral requires caution, as many instances of death from its employment are on record, and other cases have been noted in which very serious symptoms followed doses varying from 30 to 50 grains. We must also be mindful of other physiological peculiarities. Thus great muscular prostration, more especially affecting the legs, and causing staggering, not very unfrequently follows its continued use.

Various skin eruptions, usually confined to the face, beginning as spots of roseola, coalescing to form patches of erythema, and the very peculiar deep flushing of the face following the use of stimulants and due no doubt to vasomotor paralysis, have been carefully described by Dr. Crichton Browne and other observers.

Considering the undoubted fact that not only dangerous symptoms, but even death, have followed a dose of 30 grains [and even of 10 grains], we must begin, as a rule, with 20 grains [or a smaller quantity], to be repeated as occasion requires. We must remember, however, that the narcotic action of chloral is not invariably exhausted in the single sleep to which it originally gives rise, but may be held over until next night, so that our best practice will be to give a full dose only once in the forty-eight hours. The taste and smell of chloral being pungent and disagreeable, we must endeavor to render our prescription as palatable as we can. The syrup contains 10 grs. to the drachm. Or we may use the following formula:—

R. Chloral hydratis gr. xx.;
 Syrupi aurantii ℥j;
 Aq. menth. pip. ad ℥ij. M.
 Fiat haustus horâ somni sumendus.

[The addition of gr. v. of chloral to a small dose of morphia greatly adds to its hypnotic effect, and prevents unpleasant results that sometimes are produced by morphia alone.]

NOTE. — Chloral-Camphor. By rubbing together gum camphor and chloral, a fluid is produced resembling simple syrup. This has been recommended as a local anæsthetic in *neuralgia*, applied with a brush to the external skin. It is rubefacient, but not vesicating.]

CROTON-CHLORAL.

(Not Official.)

[A chlorated aldehyde of crotonic acid, made by the action of chlorine upon aldehyde.]

LOCAL ACTION.

None has been described.

CONSTITUTIONAL ACTION.

Physiological.

I. Nervous System. — 1. Brain. — Croton-chloral causes sleep in from fifteen to twenty minutes.

Therapeutical.

I. Croton-chloral has been highly praised by its discoverer, Liebreich, as a narcotic, being given by him in doses of from 15 to 30 grains. There is little English experience to quote on this heading, as the doses used here are far too small to produce sleep; but as the drug has no depressing action on the heart like chloral, there is no doubt that we may prescribe it with comparative freedom. [Subsequent experience contradicts this view, as dangerous and even fatal symptoms have been produced by ordinary doses in cases of organic heart disease. It appears to resemble chloroform in its uncertainty and danger.]

2. *Spinal Cord*.—No action is produced on the spinal cord, nor consequent muscular relaxation. Some paralyzing influence is eventually exerted on the medulla.

3. *Sympathetic and other Nervous Systems*.—No influence seems to be exerted on the vaso-motor nerves, but on the fifth a well-marked sedative effect is noted, indicated by anæsthesia of the head and face, loss of irritability of the eyeball, and failure of the nerve-trunk itself to respond to galvanic stimulation.

3. The anæsthetic influence of croton-chloral would naturally suggest its use in *facial neuralgia*, and a good deal of success has been thus obtained in dealing with this troublesome affection, doses of from 2 to 6 grains having generally been prescribed. [Before administering this remedy the heart should always be examined, as croton-chloral is contra-indicated by cardiac disorder.]

II. *Circulation*.—Croton-chloral has no tendency to weaken or lower the action of the heart [in health].

III. *Respiration and Temperature*.—Croton-chloral tends to lower the rate of breathing, and eventually kills by paralyzing the respiratory centre.

III. [Croton-chloral closely resembles chloral hydrate in its action upon the system, except in possessing greater danger. For this cause its use has been almost entirely discontinued in this country.]

CHLORINUM—CHLORINE.

[*Aqua Chlorini*, U. S. Chlorine water. Dose, fʒj.-iv.]

The use of chlorine is almost entirely confined to its external application.

Physiological Action.

1. Concentrated chlorine gas directed upon the skin

Therapeutical Action.

1. It is never, however, used as a counter-irritant.

causes redness and smarting, followed by a pustular eruption and even erysipelatous inflammation.

2. It is an excellent disinfectant, decomposing sulphuretted hydrogen and ammonium sulphide at once and more effectually than any other gas, and also destroys organic matter in the air, as it bleaches organic pigments and destroys odors, either by abstracting hydrogen or by oxidising (Parkes).

3. The inhalation of chlorine gas is stimulating or irritating to the lungs.

2. It is therefore extensively used as given off by chloride of lime to purify the air from offensive effluvia, and to destroy infectious germs. In the form of lotion it is also used to cleanse foul or sloughing sores.

3. It has therefore been used in some forms of chronic bronchitis and phthisis, but is not now much employed. [It may be used in *strychnia-poisoning*.]

INTERNAL USE.

Chlorine used to be given internally in medicine in various infectious fevers with a view to disinfection, but this has now become quite obsolete.

DOSE AND MODE OF ADMINISTRATION.

As a disinfectant it may be obtained by acting on chloride of lime with water or dilute sulphuric acid, or by pouring four parts by weight of strong hydrochloric acid on one part of powdered binoxide of manganese, or mixing four parts of common salt and one of binoxide of manganese with two parts by weight of sulphuric acid and two of water, varying the quantities according to the size of the room.

Vapor chlori is used for inhalation, and liquor chlori may be employed diluted as a lotion, or $\mathfrak{m}\text{x}$. to $\mathfrak{m}\text{xxx}$. be given internally.

DISADVANTAGE.

The great drawback of chlorine is the very irritating nature of its vapor, rendering it unsuitable for general use in rooms actually inhabited by the sick.

ACIDUM MURIATICUM—MURIATIC ACID.

[An aqueous solution of hydrochloric acid gas, of the specific gravity 1.160, U. S.]

OFFICIAL PREPARATIONS, U. S.

Acidum Muriaticum Dilutum. Dose, $\mathfrak{m}x$.–xx.

Also enters into the preparation of Acidum Hydrocyanicum Dilutum, Antimonii Oxidum, Calcii Phosphas Præcipitata, Carbo Animalis Purificatus, Quiniæ Sulphas, Strychnia, Sulphur Præcipitatum, and Acidum Nitromuriaticum, Aqua Chlorini, Barii Chloridum, Ferri Chloridum, Liquor Arsenici Chloridi, Liquor Calcii Chloridi, Liquor Ferri Chloridi, Liquor Zinci Chloridi, Morphiæ Murias, and Resina Podophylli.

ANTIDOTES.

The same as the other mineral acids, the alkalies and their carbonates: magnesia, soap, and bland drinks may be freely given. Muriatic acid stains the mouth and lips black, when taken undiluted.]

EXTERNAL USE.

Hydrochloric acid is a good form of application to *diphtheria* when it is used combined with equal parts of honey.

INTERNAL USE.

Of all the acids used in medicine, this has undoubtedly the most beneficial action in *dyspepsia*, on account probably of its forming one of the normal constituents of the gastric juice. In cases where we suspect the formation of an excessive quantity of this fluid, we may, on the principles already enunciated, limit its secretion by prescribing the acid immediately before meals. When the epigastric pain comes on immediately after eating, the condition is no doubt due to an irritable or perhaps ulcerated condition of the stomach itself, and we may best hope for success by carefully regulated diet and the use of bismuth, soda, or hydrocyanic acid. But when the pain does not set in with severity until from an hour to a couple of hours after food has been swallowed, the explanation probably is that an abnormal excess of gastric juice has been secreted, and a recurrence of this will best be checked by giving a little of the acid before meals.

Hydrochloric acid has also been much recommended by Dr. Chambers and others in *typhoid fever*, and it will generally be found that 20-minim doses of the dilute acid are very grateful to the patient, as quenching the thirst and moistening the tongue. Dr. George Johnson has recently taken exception to this, on the ground that the acid irritates the ulcerated surfaces of Peyer's patches; but not only does mere empirical experience demonstrate the harmlessness as well as the convenience of this mode of treatment, but it is quite evident that the contact of at least three alkaline secretions must considerably modify the reaction of the acid before it reaches the seat of disease, and prevent it from retaining much irritating power, and I should therefore look upon these views of Dr. Johnson as having little practical value.

DOSE.

In dyspepsia $\mathfrak{m}\mathfrak{x}\mathfrak{x}$. ad $\mathfrak{x}\mathfrak{x}\mathfrak{x}$. In typhoid fever $\mathfrak{m}\mathfrak{x}\mathfrak{x}$. every two hours.

R. Acidi hydrochlorici dil. $\mathfrak{m}\mathfrak{x}\mathfrak{x}$.;
 Sp. chloroformi $\mathfrak{m}\mathfrak{x}\mathfrak{v}$.;
 Gentianæ infusi $\mathfrak{f}\mathfrak{z}\mathfrak{j}$. M.
 S. Ter in die.

In *dyspepsia*.

CHLOROFORMUM—CHLOROFORM.

[Chloroformum Venale, U. S. Commercial Chloroform.

Chloroformum Purificatum, U. S. Purified Chloroform.

OFFICINAL PREPARATIONS, U. S.

Mistura Chloroformi ($\mathfrak{f}\mathfrak{z}\mathfrak{ss}$. in $\mathfrak{f}\mathfrak{z}\mathfrak{vi}$.). Dose, $\mathfrak{f}\mathfrak{z}\mathfrak{ss}$.

Spiritus Chloroformi ($\mathfrak{f}\mathfrak{z}\mathfrak{j}$. to Alcohol $\mathfrak{f}\mathfrak{z}\mathfrak{vj}$., U. S.).¹
 Dose, $\mathfrak{f}\mathfrak{z}\mathfrak{ss}$.-j.

Linimentum Chloroformi ($\frac{3}{4}$ chloroform, $\frac{1}{4}$ olive oil).

Liquor Gutta-Perchæ. And in preparing Atropia.

POISONING.

In the treatment of chloroform-narcosis when there is failure of the circulation, vigorous and prompt measures

¹ [Spiritus Chloroformi, Br., contains one part in twenty.]

are called for. The surface of the chest should be smartly slapped with the fringe of a towel dipped in ice-water, a piece of ice may be introduced into the rectum, the head must be lowered and the legs elevated, and ammonia held to the nose; an assistant meanwhile practising artificial respiration. This treatment Prof. Gross has found to be invariably effective, and he has not lost a patient out of more than 5,000 cases of chloroform-anæsthesia.]

LOCAL ACTION.

Physiological.

Chloroform, when allowed to remain for some time in contact with the skin, acts as an irritant, causing redness and smarting, followed by vesication.

It has also, however, some sedative properties.

Chloroform is an excellent solvent of caoutchouc, gutta percha, and many fats and resins, and it also greatly assists the cutaneous absorption of most of the alkaloids.

Therapeutical.

The locally sedative action of chloroform has led to its extensive use as an application for the relief of *rheumatic* or *neuralgic* pains, the liniment being a convenient form.

It is also a useful remedy for allaying the itching of some chronic forms of *skin disease*.

CONSTITUTIONAL ACTION.

Chloroform, when taken internally, may act as a stimulant, sedative, and antispasmodic.

It is a useful remedy in *hysteria*, *asthma*, and *nervous palpitation*, for the arrest of *sea-sickness* and other forms of vomiting, and for the soothing and quieting of some forms of *irritable cough*.

COMBINED LOCAL AND CONSTITUTIONAL EFFECT.

Under this heading it may be convenient to discuss the anæsthetic properties of chloroform, and this we will now proceed to do on the plan adopted generally throughout these pages.

Physiological.

1. *On Brain and Nervous System.*—Chloroform has first a stimulating, and secondly a sedative, action on the brain, a good deal of excitement and struggling taking place during the early stages of inhalation, whilst, during the later, narcosis is complete, and the patient lies quiet and motionless. This condition resembles natural sleep in being associated with anæmia of the brain, but differs by its rendering the patient quite insensible to external impressions, including the most severe cutting operations, this effect being due to a paralysing influence of the drug on the ganglionic centres of the sensory nerves.

The reflex functions of the cord are also lulled to slumber, and, if the inhalation is pushed too far, paralysis of the respiratory centre may ensue.

2. *Heart and Circulation.*—On the heart the influence of chloroform is at first slightly stimulating, the pulse becoming quickened; but secondary depression follows from a paralysing influence on the sympathetic ganglia, the pulse now growing slower, and the arterial tension becoming lowered.

3. *Respiration and Temperature.*—The respiration

Therapeutical.

In the early stage of inhalation the patient usually feels confused and giddy, his eyes are suffused, his face congested, and the heart beats rapidly. This is often followed by apparent insensibility, from which, however, he can readily be roused, and very frequently a stage of violent excitement ensues, during which he struggles violently and with remarkable muscular force, talking and singing incoherently meanwhile. This stage has been described as that of alcoholic intoxication. Succeeding to this we have that of 'anæsthesia,' in which he is profoundly insensible, with contracted pupils; and finally we reach that of 'narcosis,' in which the face becomes congested, the pupils dilate, and stertorous breathing sets in. Chloroform inhalation is [only] used during its first stage to alleviate the pain of childbirth, it being found that full anæsthesia under these circumstances is apt to relax the uterine muscular tissues, and not only to check their contraction, but to predispose to future hæmorrhage.

During the second stage chloroform is used for the purpose of obtaining full and complete insensibility to pain during the performance

tends at first towards increased rapidity, but if the inhalation is pushed so far as to affect the respiratory centre, the breathing grows slower, and finally ceases. We usually observe some tendency to perspiration attending chloroform inhalation, and a consequent slight reduction of temperature.

4. On the *digestive and secreting organs* chloroform seems to exert no marked influence, the sickness so frequently observed during recovery being purely reflex in character.

of operations; and this invaluable property has deprived the practice of surgery of much of its former horrors.

We also employ it freely to relax muscular tension and spasm, and so facilitate the reduction of *hernia* and *dislocation*; for diagnostic purposes, in order to dispel phantom uterine tumors, as well as to enable us to make a careful examination of extremely painful parts.

It is also of service for the relief of various forms of spasmodic affections, as *whooping-cough*, *infantile* and *puerperal convulsions*, *chorea*, and to alleviate pain, in *cancer*, during the passage of *renal* or *biliary calculi*, and under many other conditions.

POISONOUS PROPERTIES.

Chloroform may kill in two ways. (1) By primarily paralysing the heart, and this has generally been considered to be due to the inhalation of air too highly charged with chloroform vapor, Mr. Clover holding that over 5 per cent. must be considered dangerous. Dr. Brunton, however, explains very ingeniously how it is that small doses are more apt to produce this effect than large, and thus shows us, what could hardly be understood before, why so considerable

During chloroform-inhalation we must watch the pulse, and specially note enfeeblement, irregularity, or cessation of its beats. Sudden pallor of the face, lividity, and gasping for breath are signs of ill omen. If the action of the heart seems to fail, we must administer stimulants by the mouth or rectum, and excite the cutaneous surface. Galvanism seems more likely to exhaust than excite the contractility of the heart muscle; and galvano-puncture, so much

a proportion of chloroform deaths have occurred during the performance of very trivial operations.

It seems highly probable, however, that, in accordance with the views of Syme, Lister, Chiene, &c., fatal accidents from chloroform are not so liable to proceed from the heart as (2) from the respiratory function; and this mode of fatal accident has been again subdivided into two headings: 1st. Death by apnœa, or stoppage of the breathing from nervous influence or mechanical causes. 2ndly. By suffocation from excessive formation of carbonic acid in the blood. Of these, the first is by far the more common, and is often caused by falling back of the tongue, closing the glottis. It therefore follows that, whilst engaged in the administration of chloroform, the breathing must be very carefully watched.

vaunted by foreign observers, has not been tried in this country.

Chloroform accidents depending, in a great majority of cases, on failure of respiration, we must endeavor to re-excite this function by cold sprinkling or ammonia vapor, but most hopefully by the steady and persevering use of artificial respiration. Always, however, see that no mechanical hindrance to breathing exists, and more especially take care to draw the tongue well forward.

Galvanic stimulation of the phrenic nerve has been recommended, and several apparently hopeless cases have been saved by the process of inversion as originally proposed by Nélaton.

ABSORPTION AND ELIMINATION.

Chloroform is rapidly absorbed and rapidly given off by the breath and urine, in which secretion it can be readily detected.

MODE OF ADMINISTRATION.

Fatal accidents from chloroform have become so alarmingly frequent of late, that some surgeons even consider its use unjustifiable; but it is on the whole by far the best anæsthetic, and, by adopting the following precautions, we may hope to imitate the success of the Edinburgh School, where danger or inconvenience rarely occurs,

Mr. Syme having met with no death during 8,000 administrations.

1. Never permit inhalation to take place in a sitting posture, and see that the patient's neck is free from all constriction.

2. Give strict orders that no solid meal be taken for at least two or three hours previously [solid food should not be eaten for at least twelve hours, as a safe precaution], but a little beef-tea may be allowed, and a small sip of brandy is useful just before the operation. The sickness which so frequently attends a loaded stomach is not only inconvenient, but has proved fatal by suffocation from the drawing of vomited matters into the air-passages. And, in addition to this danger, vomiting is attended with special risks after such operations as ovariectomy and cataract extraction, and after the first of these it occasionally continues with exhausting pertinacity.

3. Use no special form of inhaler, but pour the chloroform freely on a towel or other porous material, and give it without fear [allowing a free admixture of the vapor with sufficient atmospheric air]. Tell the patient to close his eyes and to inspire deeply, and when the period of excitement comes on do not suspend the inhalation, but keep the towel firmly applied to the face until calm sleep is produced, or the slightest indication of stertor is heard. Complete anæsthesia is proved by abolition of reflex action, as shown by insensibility of the eye [when the cornea is lightly touched with the finger], by muscular relaxation, and by insensibility to pain.

When the operation is over, let the patient recover naturally, and do not disturb his sleep by the purposeless towel flickings so frequently to be seen in operating theatres. [But the patient should be carefully watched for at least an hour after administration.]

As regards the quantity of chloroform to be used for each inhalation, it is impossible to lay down any rule, for the inconveniences occasionally met with seem to bear no sort of proportion to the dose of the anæsthetic. [A couple of drachms may be poured from a dropping bottle upon the towel, and a few drops added from time to time to replace loss by evaporation. The chloroform should never be trusted to any but a skilled assistant.] If the chloroform be of good quality, it is safer, as shown

by Brunton, to give it freely, and it is better to trust to our own care and skill than to the fancied safety of inhalers. It can never be possible to deprive an unnatural condition like profound anæsthesia of all dangers, and even the theoretically safe instrument of Clover, with its guaranteed 3 per cent. of chloroform vapor, has been shown to be not absolutely free from risks.

It would be very satisfactory could we lay down any laws for our guidance in anticipating danger from chloroform inhalation in any special class of cases, but this unfortunately we cannot do. It is now well known that neither organic disease of the heart nor conditions of extreme debility are contra-indications; and although fatty heart is frequently discovered *post mortem*, we cannot absolutely state that this is not a mere coincidence, nor can we pretend to diagnose such degeneration with any certainty during life. Some authorities believe that chloroform is more dangerous to the old than the middle-aged or young, and there seems no doubt that habitual topers are brought under its influence with considerable difficulty.

Chloroform is most generally given internally under the form of the spiritus chloroformi, or chloric ether, in doses of from ℥x. to fʒj. [or as Mistura Chloroformi].

[CHONDRUS—IRISH MOSS.

Chondrus crispus, U. S.

Carrageen is demulcent and nutritive, and is used in decoction (ʒss. to Oij.) flavored with lemon, as a *ptisan* or drink for the sick. Boiled with milk it makes carrageen blanc mange, an acceptable and nourishing article of diet for an invalid.]

CIMICIFUGA—BLACK SNAKEROOT.

[*The root of Cimicifuga racemosa*, U. S.

OFFICIAL PREPARATION, U. S.

Extractum Cimicifugæ Fluidum. Dose, fʒss.-j.

The decoction, although not official, has been used to a considerable extent, and with benefit, in the treatment of *chorea* in children. It is sedative and antispasmodic, and in large doses vomits.]

This drug was introduced into practice in this country [England] some years ago by Sir J. Simpson, who praised it highly in *chronic rheumatism*, *lumbago*, and *hypochondriacal depression*. It has been found useful in America as an *emmenagogue*, but has never taken any real hold upon professional attention at home.

Dose of the tincture [Br.], 10 to 30 minims.

CINCHONA—CINCHONA.

[*Syn. Peruvian Bark; Cinchona Bark. The bark of all species of the genus Cinchona, containing at least two per cent. of the proper cinchona alkaloids, which yield crystalline salts, U. S.*]

VARIETIES.

Cinchona Flava. The bark of *Cinchona calisaya*, U. S.

Cinchona Pallida. The bark of *Cinchona Condaminea*, and of *Cinchona micrantha*, U. S.

Cinchona Rubra. The bark of *Cinchona succirubra*, U. S.

OFFICIAL PREPARATIONS, U. S.

Of the Yellow Bark:—

Cinchoniæ Sulphas. Dose, gr. ij.—xxx.

Decoctum Cinchonæ Flavæ. Dose, fʒij.—iv.

Extractum Cinchonæ. Dose, gr. v.—xv.

Extractum Cinchonæ Fluidum. Dose, gtt. v.—xv.

Infusum Cinchonæ Flavæ. Dose, fʒij.

Quiniæ Sulphas. Dose, gr. ij.—xx.

Pilulæ Quiniæ Sulphatis (each gr. j.).

Tinctura Cinchonæ. Dose, fʒj.—ij.

Of the Red Bark:—

Decoctum Cinchonæ Rubræ. Dose, fʒij.—iv.

Infusum Cinchonæ Rubræ. Dose, fʒij.

Tinctura Cinchonæ Composita. Dose, fʒj.—ij.]

EFFECTS AND USES.

In any comparative estimate of the absolute importance of various drugs to the human species, cinchona would probably take the second place, the first being, by universal consent, accorded to opium. The actual bark itself, however, is not now of so much importance as in former years, when it was our sole dependable remedy for the

poison of ague, and was then given in such enormous quantities as to be very embarrassing to the weak stomachs of feverish patients. This difficulty is now happily removed, and much greater precision and efficiency given to our treatment, by the introduction of quinine, the discovery of which in 1820 inaugurated a true era in therapeutics.

The preparations of cinchona are now used almost exclusively on account of their tonic properties, and in many cases of general debility, want of appetite, and loss of tone, most gratifying results are obtained by their employment either singly or in combination. Quinine itself, however, has a higher and wider therapeutic range, and has in recent years obtained so much of the careful attention of physiologists that we are bound to consider its properties with as much care and precision as the present state of science allows.

LOCAL ACTION.

Quinine is occasionally, although rarely, used as a local application; but the theory of this is so intimately bound up with its internal use, that we need not refer specially to it at present.

INTERNAL ACTION.

Physiological.

I. *Nervous System.* — 1. *Brain.* — Quinine in large doses causes curious brain symptoms, such as partial blindness, well-marked deafness and ringing in the ears, giddiness, and frontal headache, associated with a peculiarly dull, heavy expression of countenance. Binz has suggested that some at least of these phenomena may be due to partial anæmia of the brain, caused by enfeebled action of the heart.

It contracts the uterus.

2. *Spinal System.* — In frogs, quinine acts power-

Therapeutical.

I. The subcutaneous injection of quinine has been highly recommended by Surgeon-Major Hall in sunstroke.

This mode of administering the drug, however, is not unfrequently followed by inflammation and even abscess at the seat of puncture.

The oxytocic action of quinine must be, in part at least, due to its action on the nervous system; but its undoubted power in contracting the uterus has not yet been much used in medicine. [It appears to be appreciated

fully in reducing the reflex irritability of the cord, the animal lying motionless, quite insensible to external impressions, the stillness being only broken by occasional tetanic spasms.

II. *On Vascular System.*—Moderate doses of quinine increase the frequency of the pulse, but, if larger quantities be given, the rate of pulsation falls, the arterial tension diminishes, and death may even ensue from convulsions or sudden collapse following depression of the heart's action.

Quinine has a direct action on the white corpuscles of the blood, checking their amoeboid movements, and arresting their tendency to migrate through the walls of the capillaries under inflammatory conditions.

It also prevents, in some degree, the due giving up of oxygen by the red corpuscles, and may thus interfere with the oxygenation of the tissues.

III. *Respiration and Temperature.*—No influence on the respiratory function has been observed. On the temperature of a person in full health but little lowering effect is produced; when fever is present, however, the temperature may be brought down by giving large doses. Opinions differ

in the United States. Here it is frequently used as a parturifacient in single doses of gr. x.-xv.]

II. Quinine has therefore some stimulating properties.

An essential part of inflammation and suppuration is now known to be extrusion of the white blood corpuscles from the capillaries, and their subsequent transformation into pus-cells. Quinine may therefore be of great service in localised inflammations, and in checking exhausting discharges from abscesses or wounds.

III. The antipyretic properties of quinine are much prized in Germany, and it is there largely used in the treatment of *typhus*, *typhoid*, *acute rheumatism*, and *pneumonia*.

Immense doses, even reaching 75 grains, have been given, and it is observed that tolerance of the

so much as to the explanation of this effect, that it is impossible to speak with any confidence on the question. [According to Henbach the cause of death in animals poisoned with quinia is a paralytic arrest of respiration.]

drug is undoubtedly present [in fever], and that very much larger quantities can be taken than in a state of health. It is only when very freely given, however, that it has any cooling influence; and we are advised to prescribe from 25 to 45 grains in divided doses within the first half hour, as the effect would be diminished by spreading it over a longer time.

In this country we do not make very extensive use of quinine in febrile disorders, for the resulting diminution of temperature is only temporary, and has no influence on the progress of the disease. When a really dangerous degree of pyrexia is reached, we know that we can hold it readily in check by cold baths. [But where hydropathic treatment is inadmissible, quinia in full doses is an efficient antipyretic.]

IV. *On Secretion.*—In moderate doses, quinine increases the secretion of saliva, and augments, like most bitters, the flow of gastric juice, stimulating the appetite at the same time.

If larger quantities, however, are taken, an exactly opposite effect is produced; hunger is blunted, and the alkaloid, acting as an irritant to the mucous mem-

IV. Quinine is the best tonic we possess, increasing the appetite, and bracing up the intestinal mucous membrane. It is given, therefore, in all states of the system where debility is present, in simple loss of appetite, in some forms of *dyspepsia*, in *neuralgia*, especially of the supra-orbital nerve, in convalescence from acute disease, to arrest

brane of the stomach, checks the gastric juice. The urine is found to be unaltered in quantity, but the amount of uric acid and probably of urea given off is decidedly diminished.

V. Quinine is an excellent antiseptic, preventing and arresting decomposition. This it does in virtue of its poisonous influence over minute organisms, for we know that the process of decay is caused by the formation and rapid multiplication, within the putrefying fluid, of microscopic bodies called microzymes. Quinine in small doses paralyzes, and in larger destroys, these creatures, and so at once arrests further destructive action.

the *nocturnal sweating* of phthisis, &c.

V. In virtue of this poisonous influence over protoplasm and minute germs, it has been recommended in large doses in *whooping-cough*, on the ground of destroying the vitality of the thick and tenacious mucus which causes so much irritation in the bronchial tubes, or, as others hold, by destroying the minute fungus on which the disease depends. [Henke.] Again, in *hay-fever*, which is now proved to result from the local action on the Schneiderian mucous membrane of the pollen of particular grasses, Professor Helmholtz has lately pointed out that quinine applied in the form of snuff or strong solution [gr. j.-f3j.], will effect a speedy cure. Some authorities have also been inclined to explain its remarkable influence over ague by theoretically supposing that the essence of the malarial poison really consists in a minute germ or vegetable cell derived from the marshy land where the pestilence breeds, and that the antiseptic property of the drug is

here the true explanation of its therapeutic success. But this is far-fetched and barely probable.

SPECIFIC ACTION.

Quinine has what, for want of a better explanation, we must call a specific control over all malarial fevers and diseases which display any periodical tendency.

Now quinine may act as a prophylactic, and, given in moderate doses at regular intervals, may ward off attacks; and this fact is extensively taken advantage of by African travellers and troops stationed in malarial districts, to whom rations of quinine are invariably served out. When the disease, however, is fairly developed, quinine will keep it in check and even arrest its progress; and this either in smaller doses frequently repeated, or in one considerable dose taken shortly before the attack is expected.

The periodical return of the paroxysms of shivering, heat, and sweating, enables us to calculate with accuracy the very hour of the day at which to expect their recurrence; and experience has determined that the best mode of treatment is to give one full dose of 10 or 20 grains half an hour before the attack comes on.

The remarkable enlargement of the spleen which attends intermittent fever is often so rapidly diminished by quinine as to make it probable that the reduction of bulk is due to an active contraction of the substance of the organ itself.

Another curious point about the action of quinine is, that whilst it may check the rigors and rise of temperature attending the aguish paroxysm, the quantity of urinary water and urea excreted may be as much increased as they always are during the attack.

Quinine is also an invaluable agent in some of those affections which, without belonging directly to the aguish category, have something of the intermittent quality impressed on them; for example, we often find that neuralgia and various forms of headache are distinctly periodic, and return at regular intervals. In such cases quinine works wonders, and may effect a cure with almost magical rapidity.

MODE OF ELIMINATION.

Quinine, being possessed of considerable diffusive power, rapidly enters the blood, and is rapidly given out, the elimination beginning two hours after the drug is swallowed, and being nearly completed in six hours, by which time nearly all the quinine has been thrown out of the system. Although traces of its presence have been found in the saliva, sweat, and intestinal secretion, it is by the urine that the greater part is given off.

DISADVANTAGES OF ITS USE.

In addition to the headache, deafness, ringing in the ears, and other physiological phenomena, already noted, some cases have been recorded of a peculiar bright-red, scarlatinoid eruption, accompanied by intolerable itching and smarting, and followed by copious desquamation. And we must remember that idiosyncrasy here plays an important rôle, and that some persons cannot take a single grain without inconvenience.

Therefore, as before advised, it is always well, before prescribing quinine, to ask our patient if he has ever taken it before.

MODE OF ADMINISTRATION AND DOSE.

This drug is best prescribed in mixtures with a little nitric [or dilute sulphuric] acid, as tinctures do not dissolve it well ; though, as Ringer says, it is really unnecessary to combine acid, as the quinine is readily soluble in the acid of the gastric juice. But a little acid makes a more elegant mixture, by removing that turbidity which a certain quantity of the undissolved alkaloid necessarily imparts to a solution. The dose varies from about gr. j., which is the usual tonic dose, to 10, 20, 30 grains, or even more ; and although in this country a larger quantity than 10 grains is perhaps rarely prescribed, it is clearly absurd to put the maximum dose, as in the British Pharmacopœia, so low as this.

[To avoid the bitter taste of quinia is absolutely necessary in some cases. For this purpose it is sometimes ordered in sugar-coated pills, or inclosed in *cachets de pain*. The powder may be given to children in a spoonful of syrup of red orange, or mixed with honey or molasses ;

it may also be taken in coffee, or simply suspended in cold water. The quinia may be enveloped in tissue paper and twisted tightly into a ball; a little practice will enable an adult to deftly swallow such a bolus without tasting, and with but little inconvenience. The aromatic elixir of glycyrrhizin has been recommended as the best vehicle for the administration of the sulphate of quinia;¹ but preparations containing licorice, such as the officinal fluid extract of taraxacum, or the compound licorice mixture, are quite satisfactory for this purpose. Tannin has the power of disguising the taste of quinia, and, according to Rolander, it does not detract from its therapeutic properties. The following formulæ will be found useful for the administration of quinia in solution.

For children—

R. Quiniae sulphatis gr. xxiv.;
 Acidi tannici ℥ij.;
 Syr. cinnamomi ℥iij. M.
 Capiat cochleare parvum ter in die.

Or, as the disulphate—

R. Quiniae sulphatis gr. xxiv.;
 Acidi sulphurici dil. f℥j.;
 Tr. cardamomi co. f℥iij.;
 Syrupi q. s. ad f℥iij. M.
 Dose, f℥j.

Or, in a cough mixture—

R. Quiniae sulphatis gr. xxiv.;
 Acidi sulphurici dil. q. s. ad solve;
 Mist. glycyrrhizæ co. ad. f℥iij. M.
 Dose, a teaspoonful.

In the declining stage of *whooping-cough*.

For adults, any of the preceding prescriptions may be used, or we may give the following:—

R. Quiniae sulphatis gr. xlvij.;
 Acidi sulphurici dil. q. s.;
 Syr. limonis f℥ij.;
 Aquæ q. s. ad f℥vj. M.

each drachm containing one grain of quinia. A more pleasant preparation would probably be obtained by substituting Curaçoa cordial for the lemon syrup. As a tonic

¹ Remington, *Med. and Surg. Rep.*, vol. xxxvii. p. 88. Phila., 1877.

carminative, the following proves very acceptable in weakened digestion :—

R. Quiniæ sulphatis gr. xlvij. ;
 Acidi sulphurici dil. q. s. ad solve ;
 Tr. gentianæ comp. f℥iv. ;
 Syr. zingiberis q. s. ad f℥vj. M.

Dose, a dessertspoonful before meals.

Wine of aloes may be appropriately added, should constipation be present in the case.]

R. Quiniæ sulphatis gr. viij. ;
 Acidi nitrici diluti f℥ss. ;
 Tincturæ aurantii f℥ss. ;
 Syrupi aurantii f℥j. ;
 Aquæ ad f℥viiij. M.

Dose, f℥j. ter die sumend.

For a case of debility and want of appetite.

Some persons, who object to sweets, prefer the syrup to be left out ; but it will usually be found an agreeable addition. Quinine may also be given in the form of simple powder, dissolved in a glass of sherry, and when a large dose, such as 10 grs., is prescribed, it is more conveniently taken in simple suspension in distilled water. A very common plan is to order quinine with acid infusion of roses, but Squire has pointed out that a turbid and unsightly mixture is thus produced from the resulting tannate of quinine being insoluble in sulphuric acid ; whereas if the infusion be made with nitric acid, the mixture is ' bright and attractive in appearance.'

PREPARATIONS.

Pilulæ quiniæ. Containing sulphate of quinine and [honey, U. S., or] confection of hips [Dog Rose, Br.]. Dose, 2 to 10 grs.

Tinctura quiniæ [Br.]. A solution of quinine in tincture of orange-peel in the proportion of 1 in 60. Dose, f℥j. ad f℥jss. This is a useful preparation.

Vinum quiniæ [Br.]. A solution of sulphate of quinine and citric acid in orange wine, the proportion being 1 in 480. Dose, f℥ss. ad f℥j.

In addition to quinia, however, other alkaloids and substances have been detected in bark, some of which are of use in medicine. We have :—

1. Quinic or kinic acid.
2. Quino-tannic acid.

3. Cinchona red.

4. Kinovin.

These four have no therapeutic significance.

5. Cinchona has some febrifuge power.

6. Quinidia has been reported as nearly equal to quinine in the foregoing respect [and is an efficient substitute for the more expensive salt].

7. Cinchonidia is only a little less efficacious, but causes an unpleasant dryness of the mouth.

None of these preparations have been able to take the place of quinine, as they are weaker, less certain in action, and less agreeable; and quinine, notwithstanding its comparatively high price, still retains its position as our most reliable antiperiodic.

The preparations of cinchona, as we said before, are principally used for their tonic properties; and there is perhaps no more pleasant and effectual medicine of this class than the ordinary tincture of bark, whilst the decoction or infusion is in very general use as a vehicle for more active drugs.

Of the yellow bark we have the powder given in 15 gr. doses.

1. Decoctum cinchonæ [flavæ], 1 in 16. Dose, f3j. ad f3ij.

2. Extractum cinchonæ liquidum [Br.]. Dose, 10 to 30 minims.

3. Infusum cinchonæ [flavæ], 1 in 16. Dose, f3j. ad f3ij.

4. Tinctura cinchonæ, 1 in 5. Dose, f3j. ad f3ij.

[The elixir of cinchona flava, though not officinal, is an elegant preparation, and is much used. Dose, f3j.-iij.]

Of the pale bark there is the powder. Dose, 10 to 60 grs.

Tinctura cinchonæ composita. [Huxham's tincture.] Containing powdered [red] bark, bitter orange-peel, serpentaria, saffron, cochineal, proof spirit. Dose, ½ to 2 drachms.

CINNAMOMUM—CINNAMON.

[The prepared bark of *Cinnamomum Zeylanicum* (Nees Laurin), and of *Cinnamomum aromaticum* (Nees, *ibid.*), U. S.]

Oleum Cinnamomi. Dose, gtt. i.-ij.

OFFICIAL PREPARATIONS, U. S.

Tinctura Cinnamomi (3jss. to Oj.). Dose, f3j.-ij.

Aqua Cinnamomi—as a vehicle.

Pulvis Aromaticus (cinnamon and ginger each 2 parts, cardamom and nutmeg each 1 part). Dose, gr. x.-xx.

Confectio Aromatica (pulv. aromat. and honey).

Spiritus Cinnamomi (oil 3j. in Oj.). Dose, f3j.-ij.

Also enters into:—

Acidum Sulphuricum Aromaticum, Infusum Catechu Compositum, Spiritus Lavandulæ Compositus, Syrupus Rhei Aromaticus, Tinctura Cardamomi Composita, Tinctura Catechu, and Vinum Opii.]

Cinnamon is principally used for flavoring purposes, but also seems to have slight astringent properties, which make it useful in *diarrhœa*. [It has been also strongly recommended in *uterine hemorrhage*, given in substance, dose, gr. v.-x., or as a decoction made with milk.]

[COCCUS—COCHINEAL.

The female of Coccus cacti, U. S.

It enters into Tinctura Cardamomi Composita.

Cochineal has been considered to possess antispasmodic and anodyne properties, and has been recommended in *whooping-cough* (gr. $\frac{1}{3}$, s. t. d., to infants) combined with carbonate of potassium. It is also used in *neuralgia*. In pharmacy it is used as a coloring agent.]

[COLCHICUM—COLCHICUM.

Colchici Radix. *The corm of Colchicum autumnale, U. S.*

Colchici Semen. *The seed of Colchicum autumnale, U. S.*

OFFICIAL PREPARATIONS, U. S.

Extractum Colchici Aceticum (of the root). Dose, gr. j.-ij.

Extractum Colchici Radicis Fluidum. Dose, ℥ij.-iv.

Vinum Colchici Radicis (3vj. to Oj.). Dose, gtt. x.-xv. As a purgative, ℥xxx.

Extractum Colchici Seminis Fluidum. Dose, ℥ij.
-vj.

Tinctura Colchici (of the seeds, ℥ij. to Oj.). Dose,
fʒss.-j.

Vinum Colchici Seminis (of the seeds, ℥ij. to Oj.).
Dose, ʒss.-jss.]

INTERNAL ACTION.

Physiological.

The leading physiological action of colchicum is undoubtedly directed to the intestinal canal, large doses causing free vomiting and copious purging of yellowish fæces containing a large quantity of bile. The action of the heart is usually somewhat depressed, and it has been stated that the urinary secretion is augmented, but of this there is no very clear proof.

[Colchicum increases the *proportion* of the urea and uric acid, as well as the amount of urine excreted by the kidneys, according to Prof. Christison, Dr. Mac-lagan, and others.

The active principle is an alkaloid, *colchicia*, which is from 80 to 100 times stronger than the fresh corm.]

Therapeutical.

As the experiments of Rutherford have shown that colchicum increases the biliary secretion, it may be a useful adjunct to cholagogue pills, although its own purgative action is too violent to be encouraged.

Its principal use is as a remedy for *gout*, more especially the acuter forms, and here it never fails to remove pain rapidly, without, however, in any way lessening the tendency to future attacks. How it acts is unknown, and we can only call it a specific. It is also very valuable in various diseases of gouty parentage, as in some forms of *dyspepsia*, *bronchitis*, &c.; but in *acute rheumatism* it has been proved to exert rather a noxious than a beneficial influence.

DOSE AND MODE OF ADMINISTRATION.

Colchicum may be given either in one or two full doses, or in smaller quantities spread over a longer time. Of these plans the former is probably the more effectual in an acute attack of gout. The following formulæ are suitable for various gouty conditions:—

- R. Tincturæ colchici seminis ℥xx.;
 Potassæ bicarbonatis gr. x.;
 Aquæ pimentæ [Br.] f℥j.
 Misce, fiat haustus ter die sumendus.
- R. Tincturæ colchici seminis ℥xv.;
 Magnesiæ carbonatis gr. vj.;
 Magnesiæ sulphatis gr. xxx.;
 Aquæ menthæ piperitæ ad f℥j. M.
- S. Ter die sumendus.
- R. Extracti colchici acetici gr. x.;
 Pulveris digitalis,
 Extracti colocynthidis comp. ũū ℥j.
 Misce, fiant pilulæ xx. Sumat unam bis terve in die.
- R. Potassii iodidi,
 Ammonii carbonatis ũū ℥j.;
 Vini colchici f℥j.;
 Tincturæ scillæ,
 Tincturæ hyoscyami ũū f℥ij.;
 Aquæ camphoræ ad f℥iij. M.
- S. f℥ss. ter die.

Dr. Greenhow's formula for gouty bronchitis.

[Scudamore's mixture:—

- R. Magnesiæ sulphatis ℥i.-ij.;
 Magnesiæ ℥ij., gr. xl.;
 Aceti colchici f℥j.-jss.;
 Syrupi croci [Br.] f℥j.;
 Aquæ menthæ pip. f℥x. M.

Dose, f℥ss.-jss. repeated every 2 hours in a paroxysm of gout until from four to six evacuations are produced in the 24 hours.

The Acetum colchici was omitted from the Pharmacopœia in the last revision. It was made from the *corn*, and was only one-third the strength of the officinal wine of colchicum root.]

COLOCYNTHIS—COLOCYNTH.

[*The fruit, deprived of its rind, of Citrullus Colocynthis, U. S.*

OFFICINAL PREPARATIONS, U. S.

Extractum Colocynthidis (alcoholic). Used only in combination.

Extractum Colocynthidis Compositum. gr. v.-xxx.
Pilulæ Catharticæ Compositæ. 1-3 pills.]

Physiological Action.

Therapeutical Action.

Colocynth produces a good deal of irritation of the large intestine, causing Colocynth is a drastic purgative, rapid and efficient in its action, and much used

profuse watery evacuations, as an ordinary remedy in and, if given in excessive *habitual constipation* and dose, even proving fatal by various dyspeptic conditions. inflammation and ulceration. It is found, however, that its drastic action, as well as the griping to which it occasionally gives rise, may be obviated by combination with aromatics and other purgatives.

MODE OF ADMINISTRATION.

Colocynth is rarely, if ever, prescribed alone. The compound extract or pill, containing, in addition, aloes and scammony, is a useful formula; but the best mode of combination is undoubtedly that with either hyoscyamus or belladonna.

[Confectiones.

The officinal Confections are :—

Confectio Aromatica	Confectio Rosæ
“ Aurantii Corticis	“ Sennæ.]
“ Opii	

CONIUM—HEMLOCK.

[**Conii Folia.** The leaves of *Conium maculatum*, U.S.

Conii Fructus. The full-grown fruit of *Conium maculatum*, gathered while yet green and carefully dried, U. S.

OFFICIAL PREPARATIONS, U. S.

Extractum Conii Fructus Fluidum. Dose, \mathfrak{m} i.-v.

Extractum Conii (of the leaves). Dose, gr. i.-ij.

Extractum Conii Alcoholicum (of the leaves). Dose, gr. j.-ij.

Succus Conii.¹ Dose, f \mathfrak{z} ss.-j.

Tinctura Conii (3ij. to Oj.). Dose, f \mathfrak{z} ss.-j.

ANTIDOTE.

Atropia has been suggested as a physiological antidote.]

¹ [The class of **Succi**, U. S. P., only comprises **Succus Conii** and **Succus Taraxaci**.]

3. *On the Nerves*.—Herein lies the true physiological action of conium. It acts firstly on the third nerve, causing drooping of the eyelid, dilatation of the pupil, and sluggish and impaired movement of the eyeball. The influence then spreads to all the other motor or afferent nerves. A sensation of weight and enfeeblement of the legs, followed by staggering, is first experienced, and finally total paralysis is developed, the victim being entirely unable to move; and so complete may this become, that asses in Italy which have fed on hemlock have been flayed alive without the possibility of resisting in any way. This paralysing influence is at first confined to the terminal extremities of the nerves.

The sensory nerves are quite unaffected.

II. *Vascular System*.—No effect is produced on the heart or circulation.

III. *Respiration and Temperature*.—The breathing is at first unaffected, but, as the poisonous action of the drug goes on, the paralysis spreads to the respiratory centre, and death ensues from asphyxia.

Some lowering of the temperature has been observed.

IV. *Secretion*.—No influence on secretion has been noted.

3. Dr. Harley recommends its use in the violent spasm of the orbicularis met with in keratitis, but I have been unable to confirm this after careful trial.

The remarkable power of conium in effecting muscular relaxation would indicate its use in a variety of spasmodic conditions. Thus, in *laryngismus stridulus*, *trismus*, *spasmodic wry-neck*, *spasmodic stricture*, [*hysteria*, and *insanity*,] and perhaps in the reduction of *hernia* and *dislocation* where any contra-indication to the use of anæsthetics exists, it seems worthy of trial; and Dr. Handfield Jones recommends it highly in *paralysis agitans*. It must, however, be confessed that the therapeutical success of conium by no means comes up to its physiological promise.

seems to have been employed with some success in *leprosy* and *lupus*, bearing as it does a considerable analogy to the gurjun oil which has lately acquired so high a reputation in the treatment of the first-mentioned disease. Its nauseous smell, however, must always be a serious barrier to its use.

CONSTITUTIONAL ACTION.

I. *Brain and Nervous System*.—No influence is exerted by copaiba on the brain, spinal cord, or nerves.

II. *Heart and Circulation*.—No effect is produced on these organs, or on the respiration and temperature.

III. *Digestive and Secreting Organs*.—1. *Stomach and Intestines*.—Copaiba frequently causes most violent vomiting and purging.

2. It has a stimulating effect on mucous membranes generally, but more especially on those of the genito-urinary tract, in virtue of which, after slight preliminary irritation, it checks and finally arrests excessive discharges.

3. *Kidneys*.—Copaiba, and more particularly the resin, increases very considerably the water of the urine without specially affecting the solid constituents.

4. Copaiba, by internal administration, seems to stim-

Copaiba is an excellent remedy (1.) in *gonorrhœa*, where it may be given with great effect as long as the discharge continues thick and puriform. When the earliest inflammatory symptoms have been subdued by alkalies and diluents, it will prove our best remedy, and it seems to act neither purely locally nor constitutionally, but in both ways conjointly, being altered in some way in the blood, and then exerting a topical influence on the affected mucous tract. (2.)

ulate the skin, and occasionally produces an eruption of bright red papules, not unlike measles, usually beginning on the hands, spreading over the body, and causing much tingling and itching.

It is also of service in *chronic cystitis*, and in the later stages of bronchitis, when profuse and exhausting discharges have been established from the bronchial tubes. (3.) As a diuretic, the resin has been most highly praised by Dr. Wilks and Dr. F. Taylor in the *dropsy* of heart disease, in *ascites*, and in some forms of *renal affections*. (4.) Dr. Liveing, more especially, has drawn attention to the value of copaiba in *psoriasis* and other obstinate skin diseases.

ABSORPTION AND MODE OF ELIMINATION.

Copabia is very rapidly absorbed into the blood, as indicated by the communication of its nauseous smell to the breath and urine, by which channels it is principally eliminated. On the addition of nitric acid to the urine of patients taking copaiba, a milky appearance is produced by precipitation of the resin, and this is distinguished from albumen by the action of heat, which melts the resin and removes the deceptive cloud.

PECULIARITIES. MODE OF ADMINISTRATION.

The digestive disturbance occasionally caused by copaiba prevents some persons from taking it at all, and the almost invincibly nauseous nature of its flavor and odor is a serious drawback to its use. Capsules both of sugar and gelatine have been devised, which are frequently well borne; but we must remember not only that these are often too large to be swallowed with comfort by nervous persons, but that their use is apt to be followed by disagreeable eructation. No means have been proposed to obviate the measly and irritable rash which not unfrequently appears on the skins of patients under the influence of copaiba; but various forms of prescriptions are in general use, and some of these are moderately effectual in concealing the offensive flavor of this useful drug.

R. Copai bæ	f 3ss.;
Liquoris potassæ	f 3ss.;
Misce, agitando, et adde—	
Mucilaginis acaciæ	f 3ij.;
Spiritus ætheris nitrosi	f 3ss.;
Tincturæ opii	℥v.;
Aquæ [menthæ pip.]	ad f 3j.
Fiat haustus ter die sumendus.	

For *gonorrhæa*.

R. Copai bæ	f 3ss.;
Syrupi tolutani	f 3ss.;
Pulveris acaciæ	3ss.;
Acidi sulphurici aromat.	f 3ss.;
Aquæ destillatæ	f 3vj. M.
S. f 3ss. ter in die.	

For *gonorrhæa*.

R. Resinæ copai bæ	3ij.;
Alcohol	f 3v.;
Chloroformi	f 3i.;
Mucilaginis acaciæ	f 3ij.;
Aquæ	ad f 3xij. M.
Capiat semunciam ter in die.	

Formula for copaiba as a diuretic.

[COPTIS—GOLDTHREAD.

Coptis trifolia, U. S.

Goldthread is an indigenous tonic bitter resembling quassia, for which it may be substituted. It may be given in substance (gr. x.—xxx.), infusion (3j.—Oj. ; dose, f 3j.—ij.), and tincture (3j.—Oj. ; dose, f 3j.—ij.). It contains berberina, but no tannin nor gallic acid, being a simple bitter without astringency.]

[CORIANDER—CORIANDER.

The fruit of Coriandrum Sativum, U. S.

Enters into Confectio Sennæ, Infusum Gentianæ Compositum, Infusum Sennæ, and Tinctura Rhei et Sennæ.

USES.

Coriander seed is aromatic and stomachic (dose, ʒj. to 3j.) ; it is rarely used except in combination.]

[CORNUS FLORIDA—DOGWOOD.

The bark of Cornus Florida, U. S.

OFFICINAL PREPARATIONS.

Decoctum Cornus Floridæ. Dose, f ʒij.**Extractum Cornus Floridæ Fluidum.** Dose, f ʒss.

Dogwood is an indigenous, astringent tonic, and has been recommended as an antiperiodic as a substitute for cinchona.]

CREASOTUM—CREASOTE.

[A peculiar substance obtained from wood-tar, U. S.]

OFFICINAL PREPARATIONS, U. S.

Aqua Creasoti (℥iij¾. to f ʒj.). Dose, f ʒj.—iv.**Unguentum Creasoti** (f ʒss. to lard ʒj.).]

This drug [dose, gtt. i.—ij., diluted] is now but little used [owing to the difficulty of obtaining it pure, the commercial article being largely contaminated with impure carbolic acid]; but is a useful remedy in some forms of sickness and vomiting, as an inhalation for *ozæna* and various lung diseases with *fætid expectoration*, and as a local application in *toothache*.

The *mistura creasoti* [Br.], containing ℥j. to the ounce, is a convenient mode of administration. [The ointment is used in *scaly eruptions*.]

[CRETA—CHALK.

Native friable carbonate of calcium, U. S. (for preparations, see Calcium.)]

[CROCUS—SAFFRON.

The stigmas of Crocus sativa, U. S.]

Saffron is never used, save as a coloring agent.

CUBEBA—CUBEB.

[The unripe fruit of Cubeba officinalis, (Miquel), Piper Cubeba (Linn.), U. S.]

OFFICINAL PREPARATIONS, U. S.

Extractum Cubebæ Fluidum. Dose, f ʒss.—ij.

Oleo-Resina Cubebæ (8 times the strength of the powder). Dose, ℥x.—xxx.

Oleum Cubebæ. Dose, gtt. x.-xij.

Tinctura Cubebæ. Dose, f3ss.-ij.

Trochisci Cubebæ (each contains gtt. j. of the oleo-resin).]

Physiological Action.

Cubebs also has a stimulating action on mucous membranes, and more particularly on that of the bladder and urethra. In large doses it causes considerable gastro-intestinal irritation.

Therapeutical Action.

Cubebs is occasionally used in *cystitis*, but it has long been known as one of the most efficient and generally prescribed remedies for *gonorrhœa*, acting best during the acute stage of the disease.

It has also been found useful when given in the form of lozenges for the relief of relaxed sore-throat.

Dose of the powder 30 to 120 grs. ; tincture f3ss. ad f3ij. ; or of the oil $\mathfrak{m}\mathfrak{v}$.-xx.

CUPRUM—COPPER.

[**Cupri Subacetat.** Impure subacetate of copper, U. S.

Cupri Sulphas. Sulphate of copper, U. S.

Cuprum. Copper wire, U. S.

OFFICINAL PREPARATIONS, U. S.

Cuprum Ammoniatum. Dose, gr. $\frac{1}{4}$ - $\frac{1}{2}$. Copper is also used in preparing Sp. *Ætheris Nitrosi*.]

ANTIDOTES.

Albumen, ferrocyanide of potassium, followed by prompt evacuation of the stomach.

LOCAL ACTIONS.

Physiological.

Copper has caustic and astringent properties both in substance and solution.

Therapeutical.

In the form of the familiar blue-stone, or sulphate of copper, it is used as an application to *venereal sores*,

ulcers in the throat, *granular lids*, to check exuberant granulations, &c. ; and in solution it is a good lotion for various ulcerative surfaces, *gleet*, &c.

INTERNAL ACTIONS AND USES.

Physiological.

1. *Brain and Nervous System.*—Copper probably acts in some measure as a nervine tonic, but when given in larger doses peculiar symptoms set in, not unlike those of lead poisoning, and consisting of headache, neuralgic pains, cramps, and even paralysis.

2. *Circulation and Respiration.*—No special effect.

3. *Secreting Organs.*—Copper causes prompt and effectual evacuation of the contents of the stomach, acting as a direct emetic. It has an astringent influence over the stomach and intestines, and this, if pushed too far, may end in gastro-enteritis.

Therapeutical.

1. Copper has been used in small doses in *chorea*, *epilepsy*, &c., but with no specially marked benefit.

3. Copper is not so much used, however, for an emetic as sulphate of zinc, because, if by any chance it be not rejected by vomiting, it is liable to cause inflammation of the stomach.

Sulphate of copper is a good astringent in advanced and *obstinate diarrhœa*.

MODE OF ELIMINATION.

Copper is eliminated chiefly by the liver and kidneys, the intestinal canal, and the salivary glands.

Poisonous Effects.—As already seen, copper may act as a poison by causing inflammation of the stomach and intestines, as well as remote nervous symptoms.

Sulphate of copper is the only salt of the metal used in medicine, and is prescribed in the following doses:—

℞. Cupri sulphatis
 Pulveris opii āā gr. ss. ;
 Extracti gentianæ gr. iij. ;
 Misce, fiat pilulæ nocte maneque sumenda.

In a case of obstinate diarrhœa.

[As an emetic, sulphate of copper is given in doses of gr. ij.-v.]

[Decocta.

The official Decoctions are—

Decoctum Cetrariæ,	Decoctum Hæmatoxyli,
“ Chimaphilæ,	“ Hordei,
“ Cinchonæ Flavæ,	“ Quercus Albæ,
“ Cinchonæ Rubræ,	“ Sarsaparillæ Comp.,
“ Cornus Floridæ,	“ Senegæ,
“ Dulcamaræ	“ Uvæ Ursi.]

DIGITALIS—FOXGLOVE.

[The leaves of *Digitalis purpurea*, from plants of the second year's growth, U. S.]

Dose, in substance, gr. ss.-ij.

OFFICINAL PREPARATIONS, U. S.

Digitalinum (active principle). Dose, gr. $\frac{1}{80}$.

Extractum Digitalis. Dose, gr. $\frac{1}{4}$ – $\frac{1}{2}$.

Extractum Digitalis Fluidum. Dose, ℥j.-ij.

Infusum Digitalis (3ij. to Oj.). Dose, f3ij.-iv.

Tinctura Digitalis (3ij. to Oj.). Dose, ℥v.-x.]

ANTIDOTES.

After evacuation of the stomach and the administration of tannin, we must obviate the tendency to death by stimulants, and by keeping the patient rigidly to the horizontal posture, as syncope is readily excited by suddenly sitting up.

Aconite and atropia have been recommended as physiological antidotes, but we have as yet no evidence of their efficacy.

LOCAL ACTION.

Physiological.

Digitalis has been said to possess sedative properties when locally applied, and there is no doubt that it is rapidly and efficiently absorbed by the skin.

Therapeutical.

Digitalis has been used as a local sedative in cases of *joint-inflammation*, and the application to the legs of spongio-piline soaked in a strong infusion has been found to produce diuresis where other remedies have failed.

CONSTITUTIONAL ACTION.

I. Brain and Spinal Cord.

—On the brain no direct effect is produced, but the reflex irritability of the spinal cord seems to be somewhat lessened under the toxic action of the drug.

Stimulation of some portions of the vaso-motor and pneumogastric nerves seems to take place, as we shall explain more fully when treating of the influence of digitalis over the heart.

I. Although no direct action is produced on the brain tissue, it is reasonable to suppose that some alteration in cerebral function may follow the alterations in the vascular system produced by digitalis, and perhaps this may in part explain the remarkable results obtained by Mr. Jones, of Jersey, in the treatment of *delirium tremens* by the use of this drug. He found that half-ounce doses of the tincture quieted the delirium, reduced fever, and caused sleep. But this treatment can hardly be recommended, as several sudden deaths have been thus produced, and as it seems not improbable that the absence of toxic effects in many cases is due to the very partial absorption of the remedy.

II. Heart and Circulation.

Digitalis exerts a decidedly tonic and strengthening influence on the heart, render-

II. The undoubted effect of digitalis in slowing and strengthening the action of the heart, would seem to in-

ing its beats slower and more forcible, and lengthening the period of systole. This result seems to depend partly on a direct action on the heart's muscle itself, but also in some degree on stimulation of the cardiac inhibitory fibres of the vagus, which thus hold more forcibly in check the rapid rate of pulsation produced by the sympathetic nerves. If, however, the administration of the remedy be too long continued, exhaustion of the pneumogastric is apt to follow this overstimulation, and the heart, being now handed over to the unrestrained power of the vaso-motor nerve supply, runs riot in excessively rapid and feeble contractions.

The tonic influence of digitalis is attended by well-marked rise of arterial tension, and this is supposed to depend on stimulation of the sympathetic centres directly supplying the smaller vessels; and at the same time the heart is induced to act more powerfully, to overcome the increased resistance in front.

dicating its use in certain diseased conditions of that organ, but it is only recently that this tonic influence has been recognized. In former years digitalis was looked upon as essentially a cardiac sedative, and was used to quiet the tumultuous palpitation of hypertrophy; but we now know that it may be prescribed with much greater success under the following circumstances:—

1. In *palpitation and irregular action of the heart*, whether depending on organic disease or not, an important indication for its use being intermittence, or the occurrence of frequent beats which do not reach the pulse.

2. In *mitral disease*, where the cardiac action is feeble, and apparently unable effectually to propel the blood, where lividity and dropsy are setting in, the lungs becoming engorged, and the right heart oppressed.

Here we shall derive the most signal service from digitalis given in moderate doses, and combined with a little iron. Dr. B. Foster ascribes some of the good effect of digitalis in mitral disease to its slowing action, giving more time for the auricle to empty itself fully of its contained blood.

The contracting effect of digitalis on the arterioles would naturally suggest its

use in *hæmorrhage*, and it has accordingly been found of service both in *hæmoptysis* and *menorrhagia*, although in neither is it so efficacious as ergot.

3. In *dilatation of the heart*, where the weak and thin muscle acts feebly and irregularly, giving rise to palpitation and breathlessness, and causing temporary *bruits* by unequal and ineffectual closure of the mitral and tricuspid valves.

4. In *aortic disease*, when compensation has not been made complete by hypertrophy.

In short, we may use digitalis whenever the heart is acting feebly and irregularly, but by its use we cannot expect to spur on a normally constituted heart with sound muscle to overcome difficulties in front, and we must avoid its regular use in the compensatory hypertrophy of aortic disease, and in *fatty degeneration*, where its tightening effect on the smaller vessels throws an injuriously-increased amount of work on the structurally-damaged organ.

5. Ringer has drawn attention to the beneficial action of [the temporary use of] digitalis in relieving the distressing attacks of *palpitation* so often due to hypertrophy of the heart.

III. *Respiration and Temperature.*—On respiration no effect is produced, and although, in a state of health, digitalis does not lower the body heat, it undoubtedly possesses this influence over febrile conditions, Wunderlich and others bringing ample evidence to prove its power of reducing temperature in pneumonia, enteric fever, acute rheumatism, and other acute disorders.

III. Digitalis has been found of great service in those cases of *bronchitis* which are so frequently associated with a weak and dilated right heart, and where stimulation of the cardiac muscle leads to a better arrangement of circulation through the lungs.

For the reduction of temperature, digitalis is seldom used in this country, but in Germany its antipyretic virtues are prized. It seems, however, to lower the body heat without influencing the course of the disease; and as it must be given in large doses, which may derange the digestive functions even if they do not prove directly dangerous, there does not seem to be any real benefit following its employment.

IV. *Digestive and Secreting Organs.*—1. *Stomach and Intestines.*—From its bitter taste, digitalis might be credited with some tonic properties; but it is really much more likely to disorder than to increase the appetite, by causing vomiting.

It does not seem to affect the intestinal tract in any way, save in the later stages of poisoning, when diarrhoea may supervene.

2. *Kidneys.*—Digitalis increases, under certain conditions, the flow of urine without altering in any essential

2. Digitalis is a good diuretic, more especially in *cardiac* and *acute renal dropsy*, and acts best in combination

respect the quantity or proportion of its solid ingredients. Its diuretic action depends partly on the tightening effect on the arterioles, raising the blood pressure in the renal glomeruli, and partly on the increased power and regularity of the heart, improving the general conditions of circulation within the kidneys. One curious point in this connection is, that digitalis will seldom produce diuresis in healthy persons, but always acts best when dropsical accumulations have to be removed.

V. *Uterus*. — Digitalis, from its action on unstriated muscular fibre, has the property of stimulating the uterus to contraction.

Poisonous Effects.—Digitalis kills by tetanising the heart muscle, causing rapid and irregular action, followed by arrest of action. The face grows pale, the pupils dilate, vomiting and diarrhœa supervene, and death usually occurs by syncope. Cases of poisoning, however, are rare, and most of our knowledge under this heading has been derived from experiments on animals.

with squill and mercury, as in the famous Guy's pill. The theory of this action, depending on heightened blood pressure within the Malpighian tufts, explains the frequent failure of digitalis to augment the quantity of the urine in chronic kidney disease, where the arterial tension is already high.

V. It has therefore been used to contract the uterus and thus check flooding or *menorrhagia*, and it may also act by restoring its normal functions when these are suspended, as in *amenorrhœa*.

CAUTIONS, MODE OF ADMINISTRATION, &c.

In prescribing digitalis, we are generally advised to suspend its use from time to time, lest 'accumulation' lead

to poisonous symptoms; but Dr. Fothergill, an excellent authority, repudiates this notion, and his experience in this direction is large. [See Physiological Effects, p. 195.]

As regards the best form for its administration, the freshly made infusion is usually preferred, given in doses of from 2 to 4 fluid drachms.

Of the tincture we may give from 5 to 10 minims; of the powdered leaves, $\frac{1}{2}$ gr. to 2 grs.

R. Tinct. digitalis	℥x.;
Sp. æth. nit.	f℥ss.;
Inf. buchu	f℥j. M.
S. Ter in die.	

Recommended by Fothergill in *simple cardiac debility* with scanty flow of urine.

R. Pulv. digitalis	gr. xxx.;
Ferri sulph. exsic.	gr. xv.;
Pulv. capsici	gr. xl.;
Pil. aloë et myrrhæ	℥ij. M.
In pil. lx. div.	Una bis in die.

Recommended by Fothergill in *cardiac debility, gastric catarrh, and inactivity of the bowels.*

R. Tinct. ferri chloridi	℥xv.;
Glycerini	f℥i.;
Infusi digitalis	f℥ij.;
Syrupi limonis	f℥ij.;
Infusi calumbæ	ad f℥j. M.
S. Ter die sumend.	

Cardiac tonic.

DULCAMARA—BITTERSWEET.

[The young branches of *Solanum Dulcamara*, U. S.

OFFICINAL PREPARATIONS, U. S.

Decoctum Dulcamaræ (℥j. to Oj.). Dose, f℥jss.–ij.
Extractum Dulcamaræ (alcoholic). Dose, gr. x.–xx.
Extractum Dulcamaræ Fluidum. Dose, f℥ss.–ij.

Dulcamara is a feeble narcotic, formerly recommended in *mania, rheumatism, and cutaneous diseases*. At present it] is never used [to any great extent in regular practice].

ELATERIUM—ELATERIUM.

[*A substance deposited by the juice of the fruit of Momordica elaterium, Ecballium agreste (Richard), U. S.*

Elaterium. Dose, gr. $\frac{1}{4}$. (Dose of Clutterbuck's elaterium, gr. $\frac{1}{8}$.)

Elaterin (not officinal). Dose, gr. $\frac{1}{18}$ – $\frac{1}{12}$.]

Physiological Actions.

Elaterium produces irritation of the intestine, ending in inflammation where incautiously pushed, and causes the evacuation of large quantities of watery fluid. It purges equally powerfully when injected below the skin or taken by the mouth, but it is stated that solution in the bile is necessary to develop its full action. In some of the lower animals, peculiar nervous symptoms follow its use, and vomiting and great depression are liable to be produced in the human subject even by moderate doses. [It is probably our most efficient cathartic, in the treatment of *dropsical diseases*, especially after the failure of other remedies.]

Therapeutical Effects.

Elaterium is the most powerful hydragogue cathartic with which we are acquainted, and as such has been used to withdraw watery fluids from the intestines in various forms of *cardiac disease*, lightening the labors of the heart by lessening the volume of the blood, and relieving the cellular tissue and various cavities of dropsical accumulations. As, however, it is uncertain and very depressing in its action, it is now rarely used, in comparison with compound jalap powder, which seems to fulfil the same useful indications without an equal chance of seriously weakening the patient.

[Emplastra.

The officinal Plasters are : —

Emplastrum Aconiti	Emplastrum Hydrargyri
“ Ammoniaci	“ Opii
“ “ cum Hy-	“ Picis Burgundicæ
“ Antimonii [drargyro	“ “ Canadensis
“ Arnicæ	“ “ cum Cantharide
“ Assafœtidæ	“ Plumbi
“ Belladonnæ	“ Resinæ
“ Ferri	“ Saponis.]
“ Galbani Compositum	

ERGOTA—ERGOT.

[*The sclerotium of Claviceps purpurea (Tulasne), replacing the grain of Secale cereale, U. S.*

OFFICINAL PREPARATIONS, U. S.

Extractum Ergotæ Fluidum. Dose, ℥x.—fʒj.

Vinum Ergotæ (fʒij. fld. ext. in Oj.). Dose, fʒss.—ij.
(**Ergotine**—not officinal, is a purified extract. Dose, gr. v.—x.)]

EXTERNAL ACTION.

Ergot has no local action.

INTERNAL ACTIONS.

Physiological.

1. *On Nervous System.*—No special action on any part of the nervous system has been proved.

2. *On Vascular System.*—Ergot slightly depresses the action of the heart, and reduces the number of its pulsations, and it is said that the arterial tension is at first lowered in some slight degree. This effect, however, rapidly passes away, and a decided rise in arterial tension follows the contracting influence of the drug on the arterioles. On examining the web of an ergotised frog's foot, we may distinctly observe the gradual contraction of the small-

Therapeutical.

1. Dr. Brown-Séquard advises the use of ergot in some forms of *paraplegia*, unattended by irritation, and where inflammatory symptoms have subsided, believing that it acts well by contracting the dilated vessels. Dr. Crichton Browne has recently prescribed ergot with success in some forms of *chronic mania*.

2. Ergot is now allowed to be by far the best astringent in cases of *internal hæmorrhage*, and more especially in *menorrhagia*, *hæmoptysis*, and *epistaxis*, the use of the liquid extract having quite superseded the older treatment by means of acids, gallic acid and the like, whilst, if a more rapid action is required, we may subcutaneously inject ergotine. [It has also been injected into internal hæmorrhoids with success.]

It is also a valuable remedy

er vessels up to absolute obliteration of their calibre; and this is believed to be due to a primary action of the ergot on their muscular walls rather than to the intervention of the vaso-motor system. Thus we observe a direct contrast to the action of the nitrite of amyl.

in *purpura*. Von Langenbeck, of Berlin, has advocated the injection of ergotine for the obliteration of *aneurismalsacs*, but sufficient evidence has not yet been brought forward of the success of this practice; and it has also been advised in the case of old *varicose veins*. The gangrenous form of ergotismus is doubtless due to arterial contraction cutting off the supplies of blood to the extremities.

3. *Respiration and Temperature*.—No special action.

4. *Urinary Functions*.—Ergot, from its specific action on unstriated muscular fibre, tends to contract the bladder, and, by raising the tension in the Malpighian bodies of the kidneys, it increases the urinary flow.

5. *Digestive Organs*.—Ergot occasionally causes sickness, vomiting, and diarrhoea; but constipation is more likely to follow its use, from its contracting influence on the intestinal capillaries.

6. *Uterine Functions*.—Ergot has a remarkable and almost selective influence on the uterus, contracting its muscular walls, promoting its functions, and encouraging the expulsion of its contents.

4. Ergot has been used successfully, and more especially when combined with iron, in that most troublesome affection, *incontinence of urine*; but, in my own experience, belladonna is more deserving of confidence. Ergot has been recommended as a diuretic.

5. Ergot has been successfully prescribed in cases of *diarrhoea* and *dysentery*.

6. Ergot acts as an ecbotic, expelling the contents of the uterus by causing contraction of its muscular walls. It must only be used, however, where no disproportion exists between the child and the maternal passages, and where we are prepared to render instrumental aid at once, if

necessary, when the pains have been aroused. We must also remember that its prolonged use is apt to endanger the life of the child by cutting off its supplies of blood through the placenta.

Ergot is also of service in *flooding*, in reducing the size of hypertrophied or subinvolved wombs, and in promoting the destruction of *submucous polypi*, either by cutting off their supply of blood, or by squeezing them out of the uterine cavity. It is also an excellent remedy for *amenorrhœa* and some forms of *leucorrhœa*.

MODE OF ADMINISTRATION, DANGERS, CAUTIONS.

In those countries where ergotised rye largely prevails, two forms of disease attend its use. 1. The gangrenous form of ergotismus, where extensive dry gangrene of the nose, face, and extremities supervenes; and, 2. The spasmodic variety, where the victim is afflicted with most violent and agonising spasms. The therapeutic use of ergot, however, is of course never productive of any such symptoms, and the only inconvenience occasionally observed is some digestive derangement, with colicky abdominal pain.

Three preparations are officinal:—

Extractum ergotæ liquidum [fluidum]. Dose, $\mathfrak{m}\text{x}$. ad $\mathfrak{f}\mathfrak{3}\mathfrak{j}$.

Infusum ergotæ [Br.]. Dose, $\mathfrak{f}\mathfrak{3}\mathfrak{j}$. ad $\mathfrak{f}\mathfrak{3}\mathfrak{i}\mathfrak{j}$.

Tinctura ergotæ [Br.]. Dose, $\mathfrak{m}\text{x}$. ad $\mathfrak{f}\mathfrak{3}\mathfrak{j}$.

The powder is also used in doses of from 20 to 30 grs., and many experienced authorities recommend a fresh infusion made with the powder and swallowed.

Ergotine may be employed by subcutaneous injection in doses of 4 grains, but this process has the drawback of causing a painful, black, and unsightly lump at the seat of puncture.

[Extracta.

The officinal Extracts are:—

Extractum Aconiti	Extractum Hyoscyami Alcoholicum
“ Arnicæ	“ “ Fluidum
“ Belladonnæ	“ Ignatiæ
“ “ Alcoholicum	“ Ipecacuanhæ Fluidum
“ “ Radicis Fluidum	“ Jalapæ
“ Buchu Fluidum	“ Juglandis
“ Calumbæ Fluidum	“ Krameriæ
“ Cannabis Americanæ	“ “ Fluidum
“ “ Indicæ	“ Lupulinæ Fluidum
“ Chimaphilæ Fluidum	“ Matico Fluidum
“ Cimicifugæ Fluidum	“ Mezerei Fluidum
“ Cinchonæ	“ Nucis Vomicae
“ “ Fluidum	“ Opii
“ Colchici Aceticum	“ Pareiræ Fluidum
“ “ Radicis Fluidum	“ Physostigmatis
“ “ Seminis Fluidum	“ Podophylli
“ Colocynthis	“ Pruni Virginianæ Fluid.
“ “ Compositum	“ Quassiæ
“ Conii	“ Rhei
“ “ Alcoholicum	“ “ Fluidum
“ “ Fructus Fluidum	“ Rubi Fluidum
“ Cornus Floridæ Fluidum	“ Sabinæ Fluidum
“ Cubebæ Fluidum	“ Sarsaparillæ Fluidum
“ Digitalis	“ “ Compositum Flu.
“ “ Fluidum	“ Scillæ Fluidum
“ Dulcamaræ	“ Senegæ
“ “ Fluidum	“ “ Fluidum
“ Ergotæ Fluidum	“ Sennæ Fluidum
“ Erigerontis Canadensis	“ Serpentariæ Fluidum
“ [Fluidum	“ Spigeliæ Fluidum
“ Gelsemii Fluidum	“ “ et Sennæ Fluid.
“ Gentianæ	“ Stillingiæ Fluidum
“ “ Fluidum	“ Stramonii Foliorum
“ Geranii Fluidum	“ “ Seminis
“ Glycyrrhizæ	“ Taraxaci
“ “ Fluidum	“ “ Fluidum
“ Gossypii Radicis Fluidum	“ Uvæ Ursi Fluidum
“ Hæmatoxyli	“ Valerianæ
“ Hellebori	“ “ Fluidum
“ Hydrastis Fluidum	“ Veratri Viridis Fluidum
“ Hyoscyami	“ Zingiberis Fluidum.]

FARINA TRITICI—WHEAT FLOUR.

Flour is only of dietetic importance. Bread-crumbs (Mica panis) is used as a vehicle for pills.

[FERMENTUM—YEAST.

A peculiar insoluble product of the fermentation of malt liquors, U. S.

Yeast is tonic, stimulating, slightly nourishing, and laxative. It contains alcohol, gluten, carbonic acid, and bitter extractive from hops, and has been given, in doses of a pint, daily in low fevers attended with irritable stomach. It has also been used in diabetes and boils. Mixed with flaxseed meal or other farinaceous substances, it forms the yeast poultice, which is much used in gangrenous ulcers.]

FERRUM—IRON.

[**Ferri Hypophosphis.** Hypophosphite of iron. Dose, gr. v.—x.

Ferri Sulphuretum. *Protosulphuret of iron prepared by melting together sublimed sulphur and iron in small pieces, U. S.* (Used only to make Hydrosulphuric acid.)

OFFICINAL PREPARATIONS, U. S.

Ferri Chloridum. Dose, gr. v.—x.

Liquor Ferri Chloridi. Dose, ℥ij.—x.

Tinctura Ferri Chloridi. Dose, ℥x.—xl.

Ferri Citras. Dose, gr. v.—xx.

Liquor Ferri Citratis. Dose, ℥x.—xl.

Ferri et Ammonii Citras. Dose, gr. v.—x.

Ferri et Ammonii Sulphas. Dose, gr. iij.—xij.

Ferri et Ammonii Tartras. Dose, gr. x.—xxx.

Ferri et Potassii Tartras. Dose, gr. x.—xxx.

Ferri et Quiniæ Citras. Dose, gr. v.—xv.

Ferri et Strychniæ Citras. Dose, gr. iij.—v.

Ferri Ferrocyanidum (Prussian blue). Dose, gr. v.

Ferri Lactas. Dose, gr. ij.—x.

Ferri Oxalas. Dose, gr. ij.—v.

Ferri Oxidum Hydratum. Dose, gr. v. (As an antidote, gr. xx. for each grain of arsenious acid swallowed.)

Ferri Phosphas. Dose, gr. v.—x.

Ferri Pyrophosphas. Dose, gr. ij.—vj.

Ferri Subcarbonas. Dose, gr. v.—xx.

Emplastrum Ferri.

Trochisci Ferri Subcarbonatis.

Ferri Sulphas. Dose, gr. i.—v.

Mistura Ferri Composita. Dose, fʒss.

Ferri Sulphas Exsiccata. Dose, gr. i.-ij.

Ferrum Redactum. Dose, gr. ij.-v.

Pilula Ferri Carbonatis (Vallet's Mass). Dose, gr.

x.-xx.

Pilulæ Ferri Compositæ. Dose, 2 to 6 pills.

Pilulæ Ferri Iodidi (each contains gr. i. iodide of iron, and gr. $\frac{1}{8}$ of reduced iron).

Syrupus Ferri Iodidi (gr. vij. $\frac{1}{3}$ to f3j.). Dose, ℥xx.

-xl.

Liquor Ferri Nitratis. Dose, ℥x.-xx.

Liquor Ferri Subsulphatis (Monsel's Solution). Dose, ℥ij.-x.

Liquor Ferri Tersulphatis (used to prepare hydrated sesquioxide).

Potassii Ferrocyanidum. Dose, gr. x.-xv.

Iron is also used in preparing Potassii Bromidum, Ammonii Bromidum, and Ferri Bromidum (not officinal). Dose, gr. x.-xx.]

LOCAL EFFECTS.

Physiological.

Certain of the stronger preparations of iron are very astringent, corrugating and hardening the tissues by coagulating their albumen, and also contracting the smaller bloodvessels.

Therapeutical.

In the form of the perchloride [chloride], iron is one of our most generally used astringents for the arrest of *hemorrhage*, as in *epistaxis*, leech-bites, in *flooding* (injected into the uterus, as advised by Dr. Barnes), or, in fact, in any variety of passive hemorrhage.

It is also a valuable application to relaxed mucous membranes; thus, in many forms of sore throat, equal parts of tinct. ferri and glycerine will act well. It forms a good injection for *leucorrhæa*, and is extensively employed as an enema for the destruction of *thread-worms*.

Velpeau recommended the application of a strong solution of sulphate of iron to the inflamed skin in *erysipelas*, and Ricord considers that tartrate of iron has an almost specific influence over the destructive ulcerative process of *syphilitic phagedæna*.

INTERNAL ACTIONS AND USES.

Physiological.

1. *Brain and Nervous System.*—Iron has a tonic influence over the nervous system, but occasionally, in plethoric persons, the stronger preparations will cause an uncomfortable sensation of fulness and throbbing in the head.

2. *Circulation and Respiration.*—Iron acts as a tonic to the muscular structures of the heart, probably by supplying the stimulus of a larger supply of healthy blood. It is well known that iron not only augments the quantity of red coloring matter in the red corpuscles of the blood, but actually increases their number, this fact being proved by an ingenious instrument which enables us to calculate the proportion of red corpuscles

Therapeutical.

1. Iron is much used as a tonic in all conditions of *nervous exhaustion* and debility. Thus in *neuralgia*, which consists in a weakened state of the roots of certain sensory nerves, it is invaluable. In *chorea*, which generally coincides with debility, and in all cases depending in any way on want of nerve tone, it is a remedy of real value.

2. This increase in the red corpuscles of the blood, and, as a consequence, in the extent to which these important bodies carry out their function of bearing oxygen to the tissues, and finally converting it into ozone, explains further the marvellous tonic influence of iron. In *anæmia*, in protracted convalescence from acute disease, in general feebleness or debility, in *chlorosis* where it also acts by giving increased

which any given quantity of blood contains.

3. *On Secreting Organs.*—On the stomach, iron acts by bracing up the mucous membrane, and improving the appetite and digestive tone.

Its astringency tends to cause constipation.

Urine.—Iron increases the amount of urea given off by the urine, and occasionally irritates the bladder, causing frequency of micturition.

On Temperature.—Iron raises the temperature partly by increasing the waste of the tissues, but partly also in virtue of its ozonising properties.

tone to the uterine functions, in *struma*, *rickets*, *secondary syphilis*, &c., iron forms the basis of every method of treatment.

3. Here we have another explanation of its tonic properties.

This action is utilised in the treatment of *diarrhœa*, where some of the more astringent preparations, as the perntrate [nitrate, U. S.], are often of service.

[But in ordinary tonic doses, the tincture of the chloride relieves *vesical irritability*, *strangury*, and *spasmodic stricture*; and is much used in *gleet* and *chronic Bright's disease*.]

SPECIFIC ACTION.

Iron has a very marked influence in checking *erysipelas*, which must be called specific. We here use the tincture of the perchloride [chloride], and give it in doses of from f3ss. to f3j. every three or four hours. It is also of service in *diphtheria*; and Dr. Russell Reynolds has lately brought the evidence of over sixty cases to show that in *acute rheumatism*, given in large doses, it rapidly diminishes the pain and fever.

MODE OF ABSORPTION AND ELIMINATION.

The more soluble forms of iron are readily absorbed,

and become combined as albuminates with the albumen of the blood, whilst the insoluble preparations must first undergo solution in the gastric juice. When they have played their part within the organism, they are thrown out principally by the fæces, to which they impart a blackish color, but also in some measure by the urine and by albuminous secretions, such as those of the bile, and all mucous and serous membranes.

MODES OF ADMINISTRATION. DRAWBACKS.

We have seen that various inconveniences may attend the use of iron, such as headache, irritability of bladder, constipation, nausea, &c., and it further has the disadvantage of blackening the tongue and teeth; but many of these evils may be avoided by using the lighter or less astringent preparations, such as the citrate of quinine and iron, vinum, saccharated carbonate, by combining with some aperient, and by giving each dose after a meal.

But if no contra-indication exists, there is no doubt that the astringent properties of the per-salts [sesqui-salts] stand us in good stead, and in particular, no preparation is so useful on the whole as the old muriated tincture. In *secondary syphilis* the syrup of the iodide is of service, and children will always take steel wine or the saccharated carbonate well; whilst in cases of *chlorosis* with disordered menstrual function we shall find the mist. ferri composita to be very efficacious in improving the quality of the blood and gently stimulating the uterus to resume its neglected duties. The sulphate of iron has some influence in aiding the action of some purgative salts, as the sulphate of magnesia. The preparations of iron are so very numerous that no one but a student on the very brink of an examination would think of burdening his memory with them all; and we shall only refer, therefore, to those which form part of the daily stock-in-trade of the practical physician.

Vinum ferri [Br.] may be given in doses of from fʒj. to fʒij.; mistura ferri aromatica [Br.] fʒj. ad fʒij.; mistura ferri composita fʒj. ad fʒij.; ferri carbonas saccharata [Br.] gr. v. ad ʒj.; syrupus ferri iodidi ℥x. ad fʒj.; ferri et ammoniæ citras gr. v. ad x.; ferri et quiniæ citras gr. v. ad xx. Or in combination:—

R. Tincturæ ferri perchloridi [chloridi] ℥x.;
 Spiritus chloroformi ℥xv.;
 Glycerini fʒss.;
 Infusi calumbæ ad fʒj. M.
 Ter die sumend.

Chalybeate mixture.

R. Misturæ ferri compositæ,
 Decocti aloes compositi [Br.] āā fʒss. M.
 Fiat haustus ter die sumendus.

R. Magnesiæ sulphatis ʒij.;
 Ferri sulphatis gr. xxiv.;
 Acidi sulphurici diluti fʒij.;
 Infusi calumbæ ad fʒviij. M.
 Fiat mistura. Capiat cochlearia duo magna omni mane.

Ferruginous aperient.

Iron, as a rule, is best taken after a meal, but we must warn our patient to avoid the neighborhood of tea, as the mixture of these two ingredients forms a species of ink which is both nauseous and unsightly. As the more astringent preparations not only stain but injure the teeth, they may be conveniently sucked through a glass tube.

FICUS—FIG.

[The dried fruit of *Ficus Carica*, U. S.]

Figs are slightly laxative, [and enter into *Confectio Sennæ*, U. S.]

FILIX MAS—MALE FERN.

[The rhizome covered with portions of the stipes of *Aspidium Filix mas*. When used only such portion of the rhizome as has retained its green color should be employed, and the stipes, being inert, should be removed. U. S.]

OFFICIAL PREPARATION, U. S.

Oleoresina Filicis. Dose, ℥v.—xv.]

LOCAL ACTION.

Fern oil has no local action.

CONSTITUTIONAL ACTION.

Physiological.

Therapeutical.

The only marked action of the male fern is that of Fern-oil is used in medicine purely as an anthelmin-

killing tape-worms. It occasionally produces a little nausea and diarrhoea, but in most cases it can be taken without discomfort. [Its virtue resides in an oleoresin, which is the officinal title in the U. S. P., but which is termed a fluid extract in the Ph. Br.; it is also sometimes spoken of simply as the oil of male fern.]

tic. Its destructive influence over all varieties of *tenie* has been effectually proved by a great mass of evidence, and one or two doses generally succeed in dislodging the entire worm. It is essential that the draught should be taken on an empty stomach, and, the intestines having been first cleared by a purgative, we direct our patient to fast for a few hours before bed-time, when he is advised to take a drachm of the liquid extract [oleoresin] suspended in milk. Or we may avail ourselves of the following formula, which acts well in concealing the nauseous flavor of the drug:

R. Extracti filicis liquidi [oleoresinæ filicis]	fʒjss.;
Mucilaginis tragacanthæ	fʒss.;
Syrupi zingiberis	fʒij.;
Aquæ	ad fʒjss.
Misce, fiat haustus nocte vel primo mane sumendus.	

[FŒNICULUM—FENNEL.

The fruit of Fœniculum dulce (De Candolle), U. S.

OFFICINAL PREPARATIONS, U. S.

Oleum Fœniculi. Dose, ʒv.—xv.

Tinctura Rhei et Sennæ. Dose, fʒss.—ij.

Aqua Fœniculi (oil ʒxv. to Oj.).

Much used in infusion as an aromatic carminative, for *flatulent colic* in infants.]

GALBANUM—GALBANUM.

[The gum-resin of an undetermined plant, U. S.]

Dose, in substance, gr. x.—xx.

OFFICINAL PREPARATIONS.

Emplastrum Assafœtidæ.

Emplastrum Galbani Compositum (containing turpentine, Burgundy pitch, and lead plaster).

Pilulæ Galbani Compositæ (each, galbanum, gr. jss.; myrrh, gr. jss.; assafœtida, gr. ss.)]

Galbanum and ammoniacum are substances of no special theoretical value, [but are ranked as expectorants, antispasmodics, and stimulants.]

GALLA—NUTGALL.

[*A morbid excrescence upon Quercus infectoria, U. S.*

OFFICINAL PREPARATIONS, U. S.

Acidum Gallicum. Dose, gr. v.—xx.

Acidum Tannicum. Dose, gr. j.—iv.

Tinctura Gallæ (℥ij. to Oj.). Dose, f℥j —f℥iij.

Unguentum Gallæ (1 to 7 of lard).

Unguentum Acidi Tannici (℥ss. to ℥j.).

Glyceritum Acidi Tannici (℥ij. to f℥j.).

Glyceritum Acidi Gallici (℥ij. to ℥j.).

Suppositoria Acidi Tannici, each gr. v.

Trochisci Acidi Tannici, each i.]

EXTERNAL ACTION.

Physiological.

Tannic acid has a powerful local astringent action, owing partly, no doubt, to its power of coagulating albumen, and “tanning,” in some degree, any part to which it may be applied.

Therapeutical.

Tannic acid is a better topical astringent than gallic, and may be used to arrest hæmorrhage, or diarrhœa, or as an injection for gonorrhœa and leucorrhœa. Combined with glycerine, in the form of the glycerite of tannin, it is very useful as an application in various forms of sore throat, and to arrest the discharge in some chronic affections of the os uteri, in the chronic-weeping stage

of *eczema*, in *ozæna*, and *chronic otorrhæa*. It may also soothe and restrain some of those irritable coughs which depend on chronic irritation about the pharynx. Galls are used, in the form of ointment, as an application to hæmorrhoids.

INTERNAL ACTION.

Tannic and gallic acids are both powerful astringents, but as tannic acid is rapidly converted in the system into gallic acid, it is preferable to use the latter. This conviction is proved by the fact that if we take the urine of a patient to whom tannic acid has been given, we find that it will not precipitate gelatine, but that it strikes a blackish tint with the persalts of iron.

Tannic acid is rarely used internally, but gallic acid is serviceable in various forms of hæmorrhage, such as *hæmoptysis*, *hæmatemesis*, and *menorrhagia*; but in all of these it must yield the palm to ergot, and it is more especially in hæmorrhage from the kidney that its curative action comes into play. It has also been used with success to check the excretion of albumen in chronic *renal disease*.

R.	Acidi gallici	℥j.;
	Glycerini	℥ss.;
	Aquæ destillatæ	℥vj. M.
S.	℥℥j. ter die.	

For hæmorrhages.

GAMBOGIA—GAMBOGE.

[*A gum-resin derived from Garcinia Morella (Desrousseaux), var. pedicellata, U. S.*

Dose, in substance, gr. ij.—iij.

It enters into Pilulæ Catharticæ Compositæ.]

LOCAL ACTION.

Gamboge has no local action, and differs from some other remedies of the same class by not exerting its purgative effects when applied to a raw surface or injected into the cellular tissue.

CONSTITUTIONAL ACTION.

Physiological.

On the Digestive and Secreting Organs.—Gamboge exerts a good deal of irritating effect, acting more especially on the small intestine, and producing the discharge of large quantities of watery fluid. If given in sufficient quantity, inflammation and ulceration of the stomach and intestines may supervene, and death has followed the administration of a single drachm of the powder. It is also usually looked upon as a diuretic, but no trustworthy evidence has been given of its efficacy in this direction.

Therapeutical.

Gamboge is a drastic, hydragogue cathartic, formerly much used where free purgation of watery fluid seemed to be indicated, as in *cardiac dropsy*; but it is not only disagreeable and irritating, but uncertain, and has therefore been in great measure superseded by other remedies on which more dependence can be placed.

ABSORPTION, MODE OF ELIMINATION, &c.

In order to insure its full absorption it seems necessary that gamboge must be previously dissolved in the bile, as we have seen that local application does not produce any purgative effect. It is, of course, thrown out in great measure by the intestines, but the coloring matter is excreted by the urine, to which it imparts a bright yellow tinge.

MODE OF ADMINISTRATION, DOSE, &c.

The great objection to the use of gamboge is its uncertainty, as we can never precisely foresee the cases in which it will cause troublesome vomiting and purging. To try and obviate this, therefore, as well as to conceal its acrid taste, we generally combine it with other drugs; but on the whole I think I am justified in saying that gamboge has no therapeutic advantage which cannot be obtained more conveniently and agreeably by the use of other purgative drugs.

We may most conveniently prescribe the compound pill,

which contains gamboge, aloes, cinnamon, hard soap, and syrup, and of which the dose is from 5 to 15 grains. [The compound cathartic pill U. S. P. contains calomel gr. j.; jalap gr. j.; compound extract of colocynth gr. j $\frac{1}{3}$.; and gamboge gr. $\frac{1}{4}$. Dose, 1 to 4 pills.]

[GAULTHERIA—PARTRIDGE-BERRY.

The leaves of Gaultheria procumbens, U. S.

OFFICIAL PREPARATIONS, U. S.

Oleum Gaultheria, Syrupus Sarsaparillæ Compositus, and Trochisci Morphæ et Ipecacuanhæ.

Winter-green, or tea-berry, is an aromatic astringent tonic, but is chiefly used as a flavoring addition to mixtures.]

GELSEMIUM—YELLOW JASMINE.

[*The root of Gelsemium sempervirens (Gray's Manual of Botany), U. S.*

OFFICIAL PREPARATION, U. S.

Extractum Gelsemii Fluidum. Dose, gtt. m v. —x.

The tincture is generally kept in the shops, but is not official. Dose, gtt. x.—xl.]

CONSTITUTIONAL ACTION.

Physiological.

1. *Brain and Nervous System.* — Large doses of gelsemium cause vertigo and double vision. A paralyzing influence is exerted on the spinal cord, the power of voluntary movement being finally quite abolished, numbness and staggering being preliminary symptoms. Reflex irritability is also suspended, the pupil dilates, and at a later stage the sensory columns of the cord are also paralysed, producing complete anæsthesia (Bartholow).

Therapeutical.

1. Gelsemium has been prescribed with success in *neuralgia* of the fifth nerve, *intercostal*, and *ovarian neuralgia*, and *myalgia*.

Ringer tells us that large doses of the alkaloid [Gelsemia, of which gr. $\frac{1}{8}$ has caused death], at first paralyse, and then excite tetanus, which in a short time gives way to paralysis.

2. *Heart and Circulation.*

—A slightly weakening effect on the heart is noted. [It diminishes the pulse-rate by lessening the irritability of the excito-motor ganglia of the heart, and the arterial pressure by diminishing cardiac irritability and vaso-motor tonus.¹]

3. *Respiration and Temperature.*—The respirations become labored, shallow, and irregular, from diaphragmatic paralysis, death ensuing from asphyxia. The temperature falls, probably in consequence of the profuse perspiration which ensues.

It has been recommended as a remedy for *tetanus*.

3. Bartholow recommends gelsemium in various forms of convulsive or *spasmodic cough*, and in acute inflammations of the lungs and pleura he thinks it may do good by diminishing the activity of the respiratory functions.

Dose, &c.

We may give from 20 to 30 minims of the tincture every three hours, until drooping of the eyelid, dilatation of the pupil, and muscular languor are noted.

GENTIANA—GENTIAN.

[*The root of Gentiana lutea*, U. S.]

OFFICIAL PREPARATIONS, U. S.

Extractum Gentianæ. Dose, gr. ij.—iv.

Extractum Gentianæ Fluidum. Dose, ℥x.—xxx.

Infusum Gentianæ Compositum. Dose, fʒj.—ij.

Tinctura Gentianæ Composita. Dose, fʒj.—iv.

¹ [Dr. Ott, *Phila. Med. Times*, vol. v.]

Gentian is the type of the simple bitters, and is largely employed in cases where a tonic of this kind is indicated. As it contains no astringent element, it may readily be exhibited in combination with iron.]

Gentian and chiretta may be grouped together, as their action is almost precisely similar. They are both light, agreeable tonics, with pleasant aromatic bitter flavor, and may be used freely in *dyspepsia* and *debility* with loss of appetite. Gentian has always, however, been much more generally employed than chiretta, and this may be partly due to the very agreeable compound preparations of the former drug.

[GERANIUM—CRANESBILL.

The rhizome of Geranium maculatum, U. S.

OFFICIAL PREPARATION, U. S.

Extractum Geranii Fluidum. Dose, f3ss.—j.

Crowfoot, or cranesbill, is an indigenous astringent tonic, containing tannic and gallic acids, and may be used with advantage in *bowel complaints*, and as a styptic. A decoction in milk is sometimes given to children.]

GLYCERINA—GLYCERINE.

[*A colorless, inodorous, syrupy liquid, of a sweet taste, and having the sp. grav. 1.25, U. S.*

Used in preparing the official Extracta Fluida, and the glycerita.]

This useful substance is almost exclusively used externally. It moistens and softens the skin, and both prevents and cures the painful and unsightly cracks known as "chaps" on the hands. It is a serviceable application, either alone or combined with other drugs, in various forms of skin disease.

It may soothe an irritable cough by moistening the dryness of the throat, and it is stated to be the most efficient means at our command for the prevention of bedsores. In addition to this, it forms an excellent vehicle for the solution of various drugs, as seen in the five glycerites of

the Pharmacopœia, having this additional advantage, that its adhesive nature enables the active ingredient to remain longer than it otherwise would in contact with the affected surface. It is also a good solvent of the alkaloids, dissolving them freely, and, being decidedly antiseptic, it is now used for the preservation of vaccine lymph.

INTERNAL USE.

It was thought at one time that glycerine might prove an agreeable and efficient substitute for cod-liver oil; but this has not been confirmed, and glycerine is now seldom used internally.

[Glycerita.

The officinal Glycerites are—

Glyceritum Acidi Carbolici	Glyceritum Picis Liquidæ
“ Acidi Gallici	“ Sodii Boratis.
“ Acidi Tannici	

Their uniform strength is ʒij. to the ounce, except glycerite of tar, which is ʒss. to fʒj.]

GLYCYRRHIZA—LICORICE.

[*The root of Glycyrrhizæ glabra, U. S.*

Enters into the manufacture of Decoctum Sarsaparillæ Compositum, Extractum Glycyrrhizæ, Extractum Sarsaparillæ Fluidum Compositum, Infusum Lini Compositum, Pilulæ Hydrargyri, and Syrupus Sarsaparillæ Compositus.

OFFICINAL PREPARATIONS, U. S.

Extractum Glycyrrhizæ Fluidum (for flavoring).

Extractum Glycyrrhizæ. Liquorice.]

This is only used as a flavoring ingredient, and [enters into the Mistura Glycyrrhizæ Composita, Pilulæ Ferri Iodidi, Tinctura Aloes, Tinctura Rhei et Sennæ, Trochisci Glycyrrhizæ et Opii, and Trochisci Cubebæ.

Liquorice is an excellent demulcent, and in the form of decoction is used in *catarrhal affections* and *diarrhœa*. It is largely used as a flavoring ingredient, and is perhaps the best adjuvant to quinia, to disguise the bitter taste of that drug.]

[GOSSYPHII RADICIS CORTEX—BARK OF
COTTON ROOT.

*The bark of Gossypium herbaceum, and of other species of
Gossypium, U. S.*

OFFICIAL PREPARATION, U. S.

Extractum Gossypii Radicis Fluidum. Dose, f3ss.—j.

This is an efficient oxytocic and emmenagogue, largely employed in the south, in the form of decoction (f3jv. to Oj.) as a parturifacient. A tincture is also used.]

GOSSYPHIUM—COTTON.

*[A filamentous substance separated from the seed of Gossypium
herbaceum, and of other species of Gossypium, U. S.]*

OFFICIAL PREPARATIONS, U. S.

Pyroxylon. Gun Cotton.

Collodium. Pyroxylon dissolved in ether and alcohol.]

This useful substance is employed in various inflammatory conditions, with the view of excluding air and supplying warmth and slight support. Thus in *burns*, and more especially in those of a superficial nature, the immediate application of a thick layer of cotton-wool relieves the smarting pain and promotes recovery; and the same treatment may be recommended to a blister after the watery fluid has been removed from the bulla. In *acute rheumatism*, also, the patient may derive much relief from the careful and equable encircling of his inflamed joints with cotton-wool, secured in position by a few turns of flannel bandage.

It is also believed by some aurists to form the best material for the construction of an artificial membrana tympani.

[COLLODIUM—COLLODION.

Collodium cum Cantharide. Blistering Collodion.

Collodium Flexile. Flexible Collodion.]

Collodion is used to fulfil two indications:—

1. To exclude the action of the air from inflamed parts, and to prevent the patient from scratching and irritating the surface.

1. For this purpose it is used to paint over the pustules of *smallpox*, in the hope of preventing pitting. Also, in *herpes zoster* and in *erysipelas* it may be applied with advantage.

2. To exert a moderately astringent effect from the contraction which follows its drying.

2. Dr. Hare tells us that, at the very early or papular stage of a boil, we may avert subsequent suppuration by the application of collodion.

Sir D. Corrigan recommends sealing up the extremity of the prepuce by collodion to remedy the nocturnal form of *incontinence of urine* in children, and it may be of service in hæmorrhage depending on capillary oozing, and more especially in the troublesome bleeding frequently following leech-bites.

Finally, its application may facilitate the healing process in small cuts and wounds, as after the operation for harelip, and in the troublesome condition known as cracked nipples. Under all these conditions the best results may be obtained by using the flexile collodion, in which the combination with castor-oil prevents the too rapid cracking or peeling away of the protecting film.

[GUAIIACUM—GUAIIAC.

The heart-wood of Guaiacum officinale, U. S.

Guaiaci Lignum.

Guaiaci Resinæ. *A peculiar resin obtained from Guaiacum officinale, by spontaneous exudation, by incision, by dry heat, or by decoction of the comminuted wood, U. S.*

OFFICINAL PREPARATIONS, U. S.

Tinctura Guaiaci. Dose, f ʒj.-ij.**Tinctura Guaiaci Ammoniata.** Dose, f ʒj.-ij.

Also enters into Decoctum Sarsaparillæ Compositum, Syrupus Sarsaparillæ Compositus, and Pilulæ Antimonii Compositæ.

USES.

Guaiac is alterative, and is largely employed in *chronic rheumatism, rheumatoid arthritis, and syphilis*. The ammoniated tincture is the best preparation, and should be given in milk.]

GUTTA-PERCHA—GUTTA-PERCHA.

[*The concrete juice of Isonandra gutta* (Hooker. *Loudon's Journal of Botany*, 1848), U. S.]

OFFICINAL PREPARATION, U. S.

Liquor Gutta-Perchæ (in chloroform). Used in making charta sinapis.]

Gutta-percha is only adapted for external use, and is of service mechanically as a material for splints, being readily softened in hot water and moulded to the affected joint or limb. It furnishes a cheap and efficient rival to oiled silk, and its solution in chloroform forms a good and impervious covering in *smallpox, erysipelas*, and other affections where it is of importance to protect the skin from the action of the air.

HÆMATOXYLON—LOGWOOD.

[*The heart-wood of Hæmatoxylon Campechianum*, U. S.]

OFFICINAL PREPARATIONS, U. S.

Decoctum Hæmatoxyli. Dose, f ʒij.**Extractum Hæmatoxyli.** Dose, gr. x.]

Logwood has astringent properties.

[It may be combined for children as in the following formulæ :—]

It is an agreeable and efficient remedy in *diarrhæa*, and is well taken by children. We must remember that it imparts its pink color to the fæces, and to the urine should that secretion chance to be alkaline.

R. Extracti hæmatoxyli gr. x.;
 Tincturæ catechu f 3ss.;
 Syrupi f 3j.;
 Aquæ carui ad f 3ss. M.
 Ter die.

R. Pulveris cretæ aromatici [Br.] 3i.;
 Tincturæ opii f 3j.;
 Syrupi zingiberis f 3j.;
 Decocti hæmatoxyli ad f 3vj. M.
 Fiat mistura, cujus sumat unciam unam post singulas
 dejectiones liquidas.

[HEDEOMA—AMERICAN PENNYROYAL.

The leaves and tops of Hedeoma Pulegioides, U. S.

OFFICINAL PREPARATION.

Oleum Hedeoma. Dose, gtt. ij.—x.

Hedeoma is a gentle stimulant aromatic used in *flatulent colic*, *sick stomach*, and in *amenorrhœa*. In recent *suppression of the menses*, it is a popular domestic remedy, given in warm infusion.]

[HELLEBORUS—BLACK HELLEBORE.

Root of Helleborus niger, U. S.

(The dose of the powdered root is gr. ij.—iiij., as an alterative; or gr. x.—xx. as a purge.)

OFFICINAL PREPARATIONS, U. S.

Extractum Hellebori. Dose, as a purgative, gr. x.

Tinctura Hellebori. Dose, as a purgative, f 3ij.

Chiefly interesting on account of its popularity among the ancients as a hydragogue cathartic, but as it is harsh and uncertain in its action, it is rarely, if ever, used at present.]

HORDEUM—BARLEY.

The decorticated seed of Hordeum distichon, U. S.

OFFICINAL PREPARATION, U. S.

Decoctum Hordei (3j. to Oj.) *ad lib.*]

In the form of decoction, barley is used as a demulcent drink. [Malt extract is largely used as nourishment, given preferably in milk.]

HUMULUS—HOPS.

[The strobiles of *Humulus lupulus*, U. S.

Lupulina. The yellow powder separated from the strobiles of *Humulus lupulus*, U. S.

OFFICINAL PREPARATIONS, U. S.

Infusum Humuli (℥ss. to Oj.). Dose, *ad lib.*

Tinctura Humuli (℥ijss. to Oj.). Dose, f℥ss.-ij.

Extractum Lupulinæ Fluidum (℥xvj. to Oj.). Dose, f℥ss.-ij.

Oleoresinæ Lupulinæ. Dose, ℥x-f℥j.

Tinctura Lupulinæ (℥ij. to Oj.). Dose, f℥ss.-ij.]

Hops are tonic and probably narcotic, more especially in the form of the old-fashioned hop-pillow. Internally they are rarely prescribed. [They are much used as an anodyne cataplasm, either alone or with Indian meal. The preparations of lupulin are sometimes administered in *delirium tremens* as a sedative tonic.]

HYDRARGYRUM—MERCURY.

[A silver-white metal, liquid at common temperatures, and having the *sp. grav.* 13.5, U. S.

OFFICINAL PREPARATIONS, U. S.

I. In the Metallic State.

Hydrargyrum.

Emplastrum Ammoniaci cum Hydrargyri.

Emplastrum Hydrargyri.

Hydrargyrum cum Cretâ (mercury 37½ per cent.),
gr. v-xxx.

Pilulæ Hydrargyri (mercury 33⅓ per c.), 3 gr. pills.

Unguentum Hydrargyri (mercury 50 per cent.).

II. Oxidized.

Hydrargyri Oxidum Rubrum. Used externally.

Unguentum Hydrarg. Oxidi Rubri (℥j.-℥vij.).

Hydrargyri Oxidum Flavum. Used externally.

Unguentum Hydrarg. Oxidi Flavi (℥j.-℥vij.).

III. Sulphuretted.

Hydrargyri Sulphuretum Rubrum. For fumigating.

IV. As Protochloride (subchloride?).

Hydrargyri Chloridum Mite. Dose, gr. ss.-x.

Pilulæ Antimonii Compositæ (calomel $16\frac{2}{3}$ per ct.).

Pilulæ Cathartica Compositæ (each pill contains, calomel, ext. jalap, āā gr. j.; ext. colocynth. comp. gr. j. $\frac{1}{3}$; and gamboge, gr. $\frac{1}{4}$). Dose, 1 to 4.

V. As Bichloride (proto-chloride?, perchloride, Br.).

Hydrargyri Chloridum Corrosivum, gr. $\frac{1}{8}$ – $\frac{1}{10}$.

Hydrargyrum Ammoniatum. Used externally.

Unguentum Hydrarg. Ammoniati (gr. xl.– 3j.).

VI. With Iodine.

Hydrargyri Iodidum Rubrum (biniodide), gr. $\frac{1}{8}$.

Unguentum Hydrargyri Iodidi Rubri (gr. xvj. to 3j.).

Liquor Arsenici et Hydrargyri Iodidi (Donovan's Solution). Dose, m. v. –x.

Hydrargyri Iodidum Viride (protiodide). Dose, gr. $\frac{1}{4}$.

VII. With Cyanogen.

Hydrargyri Cyanidum. Dose, gr. $\frac{1}{8}$ – $\frac{1}{6}$.

VIII. With Acids.

Liquor Hydrargyri Nitratis. As a caustic.

Unguentum Hydrargyri Nitratis (Citrine ointment).

Hydrargyri Sulphas Flava. Dose, gr. $\frac{1}{4}$ – $\frac{1}{2}$ (Turpeth Mineral). As an emetic, gr. ij.

ANTIDOTES.

Acute poisoning produced by corrosive sublimate requires *albumen* (white of eggs, blood, or flour and water) and demulcents. Milk may be freely drunk, and vomiting encouraged. Gold-leaf and iron-filings form a chemical antidote, decomposing the chloride and depositing the mercury.]

LOCAL ACTIONS.

Physiological.

One preparation, the acid nitrate, is a very powerful caustic.

Other preparations are occasionally used externally for skin diseases, syphilitic ulcerations, &c., and in virtue of the destructive power

Therapeutical.

The acid nitrate is used as an application in lupoid ulcerations, and in ulcerations about the *os* and *cervix uteri*.

Calomel dissolved in lime-water [3j. to Oj.], and forming the familiar black-

which they all (but more especially corrosive sublimate) exert over the lowest forms of animal and vegetable life. Mercury, being readily absorbed by the skin, is frequently introduced into the system by this channel.

wash, is of great service in *venercal ulcerations*, either primary or secondary; and the same salt, in the form of powder, may be dusted on *condylomata* or *corneal ulcerations* with advantage. Corrosive sublimate, in the form of lotion, often checks troublesome *ulcerations of the throat*; and both this and the various forms of mercurial ointment are almost infallible remedies for *pediculi* or for *favus*, *tinea tonsurans*, and other skin diseases which are known to depend on the presence of minute vegetable growths. We must remember, however, that dangerous symptoms, and even death, have occasionally been caused by the absorption of the mineral when thus applied.

Many chronic skin diseases may be well treated by citrine ointment. *Goitre* frequently yields in India to the inunction of the biniodide, and Mr. Marshall has highly recommended the oleate of mercury as an application to various joint affections.

The external application of mercury, by the calomel vapor bath, or blue ointment, having for its object the production of constitutional effects, will be considered further on.

INTERNAL ACTIONS AND USES.

1. *Brain and Nervous System.*—Mercury, pushed up to the development of poisonous symptoms, produces a curious condition of nervous debility and tremors, which is occasionally met with in workmen who have been freely exposed to its fumes in silvering glass.

2. *Circulation and Respiration.*—One form of mercury, the perchloride, or corrosive sublimate, acts as a cardiac poison, distinctly lowering the action of the heart, but the other preparations have no such influence. Mercury causes anæmia by destroying the red corpuscles of the blood. [But in minute doses, gr. $\frac{1}{120}$ to $\frac{1}{100}$, given thrice daily for a length of time, corrosive sublimate acts as a tonic and increases the number of the red-blood corpuscles, particularly in *syphilitic anæmia*.]

3. *Secreting Organs—Stomach and Intestines.*—Mercurial preparations, and more especially calomel, act as purgatives, causing repeated grayish or greenish evacuations; the duodenum being the portion of the gut primarily acted upon. The action of mercury on the liver has provoked a good deal of controversy; and,

1. Mercury has been found of most signal service in some forms of advanced *syphilitic disease affecting the brain*.

3. In that form of *vomiting* common in children, where the stomach rejects everything suddenly and violently, $\frac{1}{2}$ gr. of hyd. cum creta or $\frac{1}{6}$ gr. of calomel every hour will often cure, as Ringer has shown.

Calomel and blue pill are frequently used as adjuncts of other purgative drugs.

Clinical evidence has most

whereas it was formerly held that the biliary secretion was directly stimulated, the experiments of Bennett and the Edinburgh Committee seem to show that, on the contrary, the flow of bile is actually checked or diminished by calomel. Two obvious fallacies underlie these experiments—the first being that the dogs, kept for considerable periods with biliary fistula, were so affected not only by the shock of the operation, but by the resulting inconvenience, general discomfort, and gradual starvation, that secretion must of necessity have been in great measure suspended; and, secondly, it is well known that a remedy which has no effect on a healthy organ may powerfully modify its condition when in a state of congestion or functional derangement.

Kidneys.—Mercury, and more especially blue pill, has the power of promoting the action of diuretics.

Saliva.—Mercury is well known to stimulate the action of the salivary glands, large quantities of their secretion being poured out when the drug is pushed far enough. The fluid, at first thick and containing much albumen, subsequently becomes thin and watery.

distinctly proved, not only that the well-known symptoms of *biliousness* may be most effectually removed by the old-fashioned blue pill and black draught, but that an increase of bile may also be thus produced in the motions. This has been explained by the irritating influence of the mercury on the duodenum, and the consequent sweeping away of the secreted bile, which, under ordinary circumstances, is well known to undergo reabsorption from the intestines.

Mercury has been supposed also to act by stimulating the gall-bladder to contract.

Thus, in the form of the old pill, containing blue pill, squill, and digitalis, we obtain a most marked diuretic effect.

The old-fashioned notion is now happily exploded, that we must measure the efficacy of our mercurial treatment by the amount of salivation.

Skin.—Inunction of ung. hydrargyri is apt to bring out a crop of irritable pimples, and one of the symptoms of mercurial poisoning is an eczematous eruption.

Mercury is supposed to stimulate absorption by rendering effused fibrine less cohesive, by promoting its disintegration, and by retarding cell-growth.

Mercury was accordingly invariably given, in former days, in all cases where any effusion of fibrine was supposed to have taken place, such as the second stage of *pneumonia*.

SPECIFIC ACTION.

Mercury may be said to act as a specific in *syphilis*, and more especially in the primary and secondary stages of that insidious malady. When we are satisfied that we have to deal with an infecting sore, the sooner we begin our mercurial treatment the better; and it is well to push it in small doses for a considerable time, until the gums are slightly affected. For this purpose moderate doses of blue pill and opium are perhaps the most effectual; but we may also derive much benefit now and then from rubbing in ℥ss. to ℥j. of blue ointment night and morning. The whole train, also, of secondary eruptions of the skin, *sore throat*, *condylomata*, *iritis*, &c., must also be subjected to mercurial treatment, and the calomel vapor bath and the bichloride of mercury will here do us good service.

It is doubtful whether, by the most careful and scientific treatment of a primary sore, we can altogether prevent the development of secondary symptoms; but if we cannot do this we can at least postpone them, and render them less severe.

In the *congenital syphilis* of young children, the local application of a little blue ointment, either rubbed into the skin or smeared over a bit of flannel wound round the waist, is eminently satisfactory in its results.

Mercury was formerly believed to have a specific influence in checking the inflammations of serous membranes, and was consequently invariably used in *peritonitis*, *pericarditis*, and *pleurisy*; but faith in this conviction has been a good deal shaken of late, and the conventional

calomel and opium does not so often appear in prescriptions as formerly.

On the continent much importance is attached to considerable doses of calomel in the early stages of *typhoid fever*, but statistics do not seem to prove any decided advantage as accruing from this mode of treatment.

DRAWBACKS, MODE OF ADMINISTRATION, &C.

It is important to be familiar with the signs which indicate when the mercurial treatment has been carried far enough. The gums generally give the first token in a delicate red line running along their margin, followed by pulpy thickening of the interdental portions, and finally retraction from the teeth. To this succeed [a coppery taste in the mouth], an increased flow of saliva and a peculiar fœtor of breath, and we generally find that the very slightest 'touching' of the gums is sufficient to show that the physiological effect of the mineral has been attained.

Whilst a patient is undergoing a mercurial course, we must keep up his constitution well with good diet, iron, and perhaps a little stimulant; for experience shows that mercury far more speedily exerts its debilitating influence on weak persons or those who are enfeebled by fasting.

We must therefore beware of its use in consumptive or strumous persons, or in those who are suffering from Bright's disease or diabetes, and recollect that idiosyncrasy may here play an important part, and that some persons are much more readily salivated than others, without known cause.

Children, more especially those under the age of two years, are rarely if ever salivated, and only show the influence of the drug by peculiar greenish stools; but we must beware of using it in them too freely, as Mr. Hutchinson has traced a peculiar malformation of the teeth to the incautious use of grey and other so-called 'teething' powders in early life. [But where salivation does occur in children it is apt to be uncontrollable, and to be followed by destructive ulceration, or gangrene of the mouth and lips with ugly cicatrices.]

MODE OF ELIMINATION, &C.

Mercury is eliminated principally by the urine, but also in smaller degree by the saliva and the biliary and intestinal secretions.

MODE OF ADMINISTRATION, DOSE, &c.

In the treatment of syphilis, mercury may be given by inunction, in which from ℥ss. to ℥j. of blue ointment is rubbed into the skin once or twice a day, varying the place of application so as to avoid that cutaneous irritation which may otherwise result. This method, although very effectual, is dirty, and rather liable to cause excessive salivation.

Fumigation is also extensively employed, but it is only of real service in the cutaneous affections dependent on secondary syphilis, where the actual deposition of the vaporised calomel on the skin produces a beneficial local influence. Twenty grains of calomel are used at each sitting, and are diffused along with watery vapor by a spirit lamp, and brought in contact with the patient, as he sits covered with a blanket, on a perforated chair, over the fumigating apparatus.

Corrosive sublimate has been used by subcutaneous injection, but in this way it creates great local irritation, and is much better given by the mouth, acting especially well in secondary syphilis, combined with iodide of potassium. Thus:—

- | | | |
|----|---------------------------------------|------------|
| R. | Hydrarg. perchlor. [chlor. corrosiv.] | gr. ss.; |
| | Potassii iodidi | ℥ss.; |
| | Decocti cinchonæ | ℥℥viij. M. |
| S. | ℥℥j. ter die post cibum. | |
| R. | Hydrarg. perchlor. [chlor. corrosiv.] | gr. ij.; |
| | Acidi hydrochlorici diluti | ℥℥ij.; |
| | Mellis depurati | ℥℥j.; |
| | Aquæ destillatæ | ad ℥℥x. M. |

An excellent gargle for *syphilitic throat ulceration*.

Opinions vary considerably regarding the best form of mercury for internal administration in the treatment of syphilis. Mr. Hutchinson prefers hydrarg. cum cretâ in doses of from gr. iij. to gr. v. two or three times a day. Ricord, on the other hand, advises gr. j.—iij. of the green iodide, whilst others are content to employ the pil. hydrarg. in gr. j.—iij. doses in pill, keeping its purgative properties in check by a little opium.

- | | | |
|----|--|----------|
| R. | Pil. hydrargyri | gr. ij.; |
| | Pulveris opii | gr. ℥; |
| | Confectionis rosæ | q. s. |
| | Ut fiat pilula quartâ quâque horâ sumenda. | |

R. Hydrarg. subchlor. [chlor. mitis] gr. xij. ;
 Mannæ gr. vj. ;
 Pulveris tragacanthæ compositiæ [Br.] gr. vj. M.
 Divide in pilulas sex. Capiat duas pro re natâ.

A good purgative formula.

For purgative purposes the blue pill is generally prescribed in 5 grain doses, taken overnight, and aided by some fluid aperient in the morning. As a diuretic the following is the useful old combination, sometimes known as the 'Guys,' and sometimes as 'Baillie's Pill : '—

R. Pilulæ hydrargyri gr. iij. ;
 Pulveris scillæ gr. jss. ;
 Pulveris digitalis gr. ss. M.
 Fiat pilula bis terve die sumenda.

[Unguentum hydrargyri nitratis, citrine ointment, is much used as a stimulant and alterative application in chronic skin-diseases and ophthalmia. It generally requires to be diluted with lard.

The decoction of Zittmann may be used with great advantage as a gentle diaphoretic and alterative in secondary syphilis, either alone or as an adjuvant to mercurials. It has been also used with advantage in scrofulous conditions of the system, in chronic rheumatism, in skin-diseases, and obstinate ulcerative affections. The formula of the Prussian Pharmacopœia is as follows :—

Take of sarsaparilla 12 ounces, spring water 90 pounds. Digest for twenty-four hours ; then introduce, enclosed in a small bag, 1½ ounces of sugar of alum (equal parts alum and white sugar), ½ ounce of calomel, and a drachm of cinnabar. Boil to thirty pounds, and near the end of the boiling add aniseed, fennel-seed, of each half an ounce, senna 3 ounces, and liquorice root 1½ ounces. Put aside the liquor under the name of THE STRONG DECOCTION. To the residue add 6 ounces of sarsaparilla and 90 pounds of water. Boil to 30 pounds, and near the end add lemon-peel, cinnamon, cardamom, liquorice, of each 3 drachms. Strain, and set aside, the liquor under the name of THE WEAK DECOCTION. Mercury was detected by Wiggers in this decoction in very small proportion. It should not be prepared in metallic vessels lest the mercurial in solution should be decomposed. The decoction may be drunk freely.—*U. S. Dispensatory*, 14 ed., Phila. 1877, p. 1140, note.]

[HYDRASTIS—HYDRASTIS.

The root of Hydrastis Canadensis, U. S.

OFFICINAL PREPARATION, U. S.

Extractum Hydrastis Fluidum. Dose, fʒij.—iv.

Hydrastis is an indigenous bitter tonic, containing the alkaloids berberina and hydrastia, and is said to have decided diuretic properties. A decoction has been used as an injection in *gonorrhœa*. Its exact therapeutic place among remedies does not appear to be well defined.]

HYOSCYAMUS—HENBANE.

[**Hyoscyami Folia.** The leaves of *Hyoscyamus niger*, U. S.

Hyoscyami Semen. The seed of *Hyoscyamus niger*, U. S.

OFFICINAL PREPARATIONS, U. S.

Extractum Hyoscyami (from the juice). Dose, gr. i.—ij.

Extractum Hyoscyami Alcoholicum (dried leaves). Dose, gr. i.—ij.]

Extractum Hyoscyami Fluidum (leaves). Dose, ℥v.

Tinctura Hyoscyami (dried leaves, ʒij. to Oj.). Dose, fʒss.—ij.

Hyoscyamus is, like *belladonna*, a hypnotic and mydriatic, and owns the same antidotes.]

The remarks made with reference to *stramonium* are equally applicable to *hyoscyamus*, which also contains an alkaloid, *hyoscyamia*, probably identical with *atropia*. The main point of difference, then, from *belladonna*, is the superior narcotic powers of *hyoscyamus*, which have been especially prized and developed in lunacy practice. It is also a favorite remedy in painful and irritable *affections of the bladder*, where it seems to exert a marked soothing influence, and, as an expectorant, it is an excellent addition to cough mixtures.

R. Extracti belladonnæ gr. iij.;
Camphoræ gr. xij.;
Extracti hyoscyami gr. xv.

Misce, fiant pilulæ sex, quarum sumat unam horâ decubitûs.

Narcotic.

R. Tincturæ hyoscyami ℥xxx.;
 Potassii carbonatis gr. x.;
 Syrupi papaveris [Br.] f℥ij.;
 Aquæ camphoræ ad f℥jss.
 Misce, fiat haustus horâ somni sumendus.

Narcotic.

R. Vini ipecacuanhæ f℥ij.;
 Succo hyoscyami [ext. hyoscyami fluid.] f℥j.;
 Tincturæ scillæ f℥ss.;
 Syrupi tolutani f℥j.;
 Aquæ carui ad f℥vj.

Misce. Cap. semunciam ter quaterve in die.

Cough mixture.

Dr. Robert Lawson, late of the West Riding Asylum, has recently made a large variety of very interesting physiological and therapeutical observations on the actions and uses of hyoscyamia, the alkaloid of hyoscyamus. He has found that it produces "a subdued form of mania, accompanied by almost complete paralysis of the voluntary muscles, and ending in quiet and refreshing sleep;" and he thinks that this might advantageously be substituted for many forms of extreme excitement occurring among the insane. He has derived great benefit from the drug in "the treatment of recurrent, acute, and subacute *mania*, and the monomania of suspicion," and recommends the following formula:—

R. Hyoscyamiæ gr. j.;
 Sp. ætheris ℥viij.;
 Alcohol ℥xxiv.;
 Aquæ fontis ad f℥j.
 Misce, ut fiat haustus.

[ICHTHYOCOLIA—ISINGLASS.

The swimming-bladder of Acipenser Huso, and of other fishes, U. S.

Isinglass is only used in medicine as an article of diet for the sick, and as the basis of *court-plaster*.]

[IGNATIA—IGNATIA.

The seed of Strychnos Ignatia, U. S.

OFFICIAL PREPARATION, U. S.

Extractum Ignatia. Dose, gr. $\frac{1}{4}$ – $\frac{1}{2}$.

Is used for the same purpose as Nux Vomica, but the extract, containing more strychnia, is a somewhat stronger preparation.]

[Infusa.

The officinal Infusions are:—

Infusum Angusturæ	Infusum Lini Compositum
" Anthemidis	" Pareiræ
" Buchu	" Picis Liquidæ
" Calumbæ	" Pruni Virginianæ
" Capsici	" Quassiæ
" Caryophylli	" Rhei
" Cascarillæ	" Rosæ Compositum
" Catechu Compositum	" Salviæ
" Cinchonæ Flavæ	" Sennæ
" Cinchonæ Rubræ	" Serpentariæ
" Digitalis	" Spigeliæ
" Eupatorii	" Tabaci
" Gentianæ Compositum	" Taraxaci
" Humuli	" Valerianæ
" Juniperi	" Zingiberis.]
" Krameriæ	

IODINIUM—IODINE.

[A bluish gray non-metallic element obtained principally from the ashes of sea-weeds. It rises in purple vapor when heated.

OFFICINAL PREPARATIONS, U. S.

Tinctura Iodinii (iodine $\bar{3}j$. to Oj.). For external use.

Tinctura Iodinii Composita (iodine $\bar{3}ss$.; potass. iod. $\bar{3}j$.; alcohol Oj.). Dose, gtt. x.—xx.

Liquor Iodinii Compositus (iodine $\bar{3}vj$.; potass. iod. $\bar{3}jss$.; water Oj.). Dose, gr. v.—x.

Unguentum Iodinii.

Unguentum Iodinii Compositum.

Liquor Arsenici et Hydrargyri Iodidi (Donovan's Solution). Dose, gtt. v.—x.

Syrupus Ferri Iodidi (iodide of iron, $7\frac{1}{2}$ gr. to f $\bar{3}j$.). Dose, \mathfrak{m} x.—xxx.

Pilulæ Ferri Iodidi (ferri iodid. gr. j.; ferri redact. $\frac{1}{6}$).

Also enters into Sulphuris Iodidum, Unguentum Sulphuris Iodidi, Arsenici Iodidum, Hydrargyri Iodidum Rubrum, Unguentum Hydrargyri Iodidi Rubri, Hydrargyri Iodidum Viride, Plumbi Iodidum, Potassii Iodidum, and Unguentum Potassii Iodidi.

ANTIDOTES.

Starch and demulcents.

INCOMPATIBLES.

With Iodine.—Alkalies and alkaloids (quinia and strychnia); extracts containing starch; water precipitates the iodine from *tinctura iodinii*. The compound tincture may be diluted with water without precipitation.

With Potassii Iodidum.—Acids, acetate of lead, and the metallic salts generally.

With Ferri Iodidum.—Lime-water, alkalies, and the vegetable astringents.]

LOCAL ACTIONS.

Physiological.

Iodine in substance is never used save for its antiseptic properties. Dissolved in spirit, however, it is an excellent counter-irritant, producing itching and smarting of the skin, with desquamation of cuticle, and even blistering if the application be too frequently repeated. It has been shown that this local action of iodine is attended by a very free extrusion of colorless blood corpuscles into the subcutaneous cellular tissue.

Experiment has proved that iodine is not absorbed into the system through the unbroken cuticle. [But fatal poisoning has resulted from absorption of a solution of iodine, which had been injected into an ovarian cyst.

Iodine and the soluble iodides are incompatible with the alkaloids as well as with most metallic salts in solution.]

Therapeutical.

It is therefore of some value for the correction of fœtor in drains, &c.

The tincture or liniment of iodine is very extensively used as a counter-irritant application to *enlarged glands, chronic abscesses, swollen joints, chilblains*, and to various forms of skin disease, more especially the common varieties of *ring-worm*, which speedily yield to this treatment. It is very useful when painted over the chest in *chronic pneumonia* and fibroid and tubercular *affections of the lungs*; and Mr. Jordan, of Birmingham, has recently drawn attention to the great success attained by him in the dispersion of *boils, carbuncles, and suppurating glands* by iodine freely applied to a neighboring vascular area.

It is also an excellent injection into various secreting cavities, curing *hydrocele* by obliterating the sac of the

tunica vaginalis, acting well on the same principle in some rare cases of *ovarian dropsy* and *bronchocele*, and deodorising and lessening discharges in *empyema* and *suppurating glands*. [In *scrofula* Lugol's solution may be injected directly into the enlarged glands, with great benefit.]

[For the CONSTITUTIONAL EFFECTS, see Iodide of Potassium.]

[IODOFORMUM—IODOFORM.]

In yellow, scaly crystals having the odor of saffron. It is insoluble in water, but soluble in alcohol, ether, and the fixed and volatile oils. By a heat above 250°, it is decomposed, giving off violet vapors. U. S.

It is prepared by decomposing an alcoholic solution of iodide of potassium with lime. As a local anæsthetic, it is applied in powder to *painful ulcers*, whether chronic, cancerous, or syphilitic, where it relieves pain and promotes cicatrization. Suppositories (gr. v.-x.) are used in *hæmorrhoids* and *uterine cancer*. In ethereal solution (20 per cent.), it has been highly recommended as an application in *chronic inflammation of the throat*.¹

IPECACUANHA—IPECACUANHA.

[*The root of Cephælis Ipecacuanha, U. S.*

OFFICIAL PREPARATIONS, U. S.

Extractum Ipecacuanhæ Fluidum. Dose, gtt. xxx.

Pulvis Ipecacuanhæ Compositus. Dose, gr. x. Dover's powder (ipecac. 1 pt., opium 1 pt., carb. potass. 8 pts.).

Trochisci Ipecacuanhæ.

Trochisci Morphiæ et Ipecacuanhæ (Morphia gr. $\frac{1}{40}$).

Syrupus Ipecacuanhæ (f3ij. extract to syrup xxx.).

Dose, f3j.-f3ss.

Vinum Ipecacuanhæ (f3ij. extract to sherry wine f3xxx.). Dose, f3j.-iv.]

¹ [Phila. Med. Times, vol. iv. p. 4, 1873.]

LOCAL ACTIONS.

Physiological.

The prolonged application of ipecacuanha to the skin causes some irritation, followed by the appearance of vesicles, pustules, and even troublesome ulceration. In some persons the powdered root causes violent irritation of the respiratory passages, ranging from symptoms resembling hay-fever up to a spasmodic condition analogous to true asthma.

Therapeutical.

The use of the slowly acting and pustulating forms of counter-irritation has fallen out of fashion, as they are not only disfiguring, but give less relief than more sedative applications.

The only way in which we find ipecacuanha employed locally is in the form of spray, which Prof. Ringer has found very useful in *chronic bronchitis*.

CONSTITUTIONAL ACTIONS.

I. *Brain and Nervous System.*—1. No effect seems to be produced on the brain.

2. Ipecacuanha has a markedly stimulating influence on that centre in the medulla oblongata which presides over the action of vomiting. Whether by subcutaneous injection, or by being taken into the stomach, it causes, within a moderate period, a decided but mild emetic effect; and as this may arise either from irritation of the mucous membrane of the stomach, or from a primary stimulation of the vomiting centre itself, ipecacuanha must be ranked among both the direct and the indirect emetics.

It may be said generally to occupy a middle place between sulphate of zinc and

2. Ipecacuanha cannot be recommended in cases of poisoning, for not only does it act too slowly, but its nauseating and depressing influence may be injurious. It is of great service, however, in many of those affections of the throat or respiratory organs where we wish to empty the lungs or detach foreign bodies or false membranes from the larynx or trachea, as in *bronchitis*, *croup*, *diphtheria*, &c.

A most remarkable fact in the action of this drug is its power, when given in small doses, of checking *vomiting*. Thus, in the vomiting of pregnancy, in the irritability

tartar emetic, being neither so prompt as the first, nor so nauseating as the second.

II. *Circulation.*—Ipecacuanha has no direct influence on the heart or circulation, save the usual depression following nausea and vomiting.

III. *Respiration and Temperature.*—No effect is produced on the rapidity of the respiratory function, save the temporary acceleration usually accompanying the act of vomiting. There seems no doubt, however, that ipecacuanha causes an increased secretion from the mucous membrane of the bronchial tubes. After poisoning by ipecacuanha, the lungs have generally been found in a bloodless condition.

IV. *Digestive and Secreting Organs.*—I. *Stomach and Intestines.*—As already noted, ipecacuanha causes some irritation of the terminal filaments of the pneumogastric nerve distributed to the stomach, and thus sets in motion the reflex machinery necessary to produce

of stomach of children, and in other dyspeptic conditions, a drop of ipecacuanha wine taken every hour will often prove truly curative. At present this must be looked upon as one of the enigmas of therapeutics.

III. Ipecacuanha is therefore a most useful expectorant, thinning and diluting the pulmonary mucus, and thus facilitating its expulsion. It is hence almost universally employed in *bronchitis*, *common catarrh*, *winter cough*, &c. It was formerly used, and with some alleged success, in *hæmoptysis*, 5-grain doses repeated at short intervals exerting a marked depressing effect, and thus checking the tendency to bleeding; but with the introduction of more effectual remedies, this mode of treatment has now fallen into disuse.

IV.—I. Ipecacuanha is indicated in some overloaded conditions of the stomach, caused by excessive indulgence either in food or drink; and the dull aspect, coated tongue, foul breath, headache, and nausea, may be promptly relieved by a good emetic dose.

vomiting. On the mucous lining of the intestinal canal, also, its effects are undoubted, as indicated by its action in disease; but we are at present unable to give any satisfactory explanation of its often marvelous influence over dysentery in its various forms.

In *acute dysentery*, ipecacuanha is now looked upon as a never-failing specific. It must here be taken in full doses, from 15 to 20 grains being given at once and repeated in two hours; and although the first dose may be rejected by the stomach, toleration is speedily established, and no more vomiting is produced. Some authorities recommend a previous administration of laudanum to quiet the stomach.

Under this treatment the pain and tenesmus rapidly subside, the motions regain natural color and consistence, and the patient makes a satisfactory recovery.

In cases of *dysenteric diarrhœa* so often met with in this country, and more especially in children, ipecacuanha in much smaller doses is also a very effectual remedy, the indications for its use being any appearance of blood or mucus in the stools, with pain and straining. In the more ordinary forms of diarrhœa, however, it is quite useless.

2. *Liver*. — Ipecacuanha seems to have some stimulating power over the hepatic secretion.

3. *Skin*. — Ipecacuanha promotes slightly the cutaneous secretion, independ-

2. It has therefore been given in the form of pill, and combined with other remedies, to relieve the *sluggish digestion* caused by a deficiency of bile.

3. Ipecacuanha combined with opium, in the form of "Dover's Powder," is a

ent of the tendency to perspiration usually attending the action of emetics.

well-known and tolerably effectual diaphoretic, much used in *chronic rheumatism* and feverish attacks.

MODE OF ELIMINATION, &c.

It is probable that as much of the ipecacuanha as remains after the action of vomiting is eliminated from the system by the biliary and intestinal secretions.

MODE OF ADMINISTRATION.

The action of ipecacuanha wine is so notoriously uncertain, that, when we wish to obtain the full emetic effect of the drug, it is best to have recourse to the freshly powdered root (15 to 30 grains), remembering, however, that children will bear unusually large doses.

In the treatment of dysentery also, we shall derive most advantage from the use of the powder, and in ordinary cases of dysenteric diarrhœa we may give from $\frac{1}{2}$ to 2 or 3 grains in combination with compound tragacanth powder.

Vinum ipecacuanhæ, in doses of from \mathfrak{m} x. to \mathfrak{z} j., is an almost invariable ingredient of cough mixtures.

[Emetia, the alkaloid of ipecacuanha, is not official, but is an efficient emetic in doses of gr. $\frac{1}{2}$ to $\frac{1}{4}$.]

JALAPA—JALAP.

[*The tuber of Exogonium purga* (Bentham, *Botanical Register*),
Ipomœa Jalapa (Nuttall), *U. S.*

Dose, in substance, gr. x.-xxx.

OFFICINAL PREPARATIONS, U. S.

Extractum Jalapæ. Dose, gr. v.-x.

Pulvis Jalapæ Compositus (jalap 1 pt., cream of tar-tar 2 pts.). Dose, gr. xx.- \mathfrak{z} j.

Resina Jalapæ. Dose, gr. ij.-iv.

Tinctura Jalapæ (powder \mathfrak{z} ij.-Oj.). Dose, \mathfrak{z} j.-ij.]

Physiological Action.

Therapeutical Action.

The action of jalap resembles that of scammony, only differing in being less irritant and more effectual in

Jalap is undoubtedly one of our best hydragogue cathartics, and is much used in cerebral lesions, in *kidney*

promoting the flow of watery fluids from the bowels.

disease, where the excretion of effete products threatens to become suspended, and when dropsy is setting in; in such cases smart purgation by pulv. jalap. co. will often produce striking benefit.

In *cardiac disease* also, when the right side of the heart is engorged by *emphysema* or *bronchitis*, free catharsis will unload the distended and laboring organ, and relieve the condition of intense dyspnœa, with the cold and livid surface and indications of approaching death. Jalap also acts well as an ordinary or habitual purgative, and is generally prescribed in the form of the compound powder, containing cream of tartar.

[JUGLANS—BUTTERNUT.

The inner bark of the root of Juglans cinerea, U. S.

OFFICIAL PREPARATION, U. S.

Extractum Juglandis. Dose, as a laxative, gr. v.—x.; as a purgative, gr. xx.—xxx.

Juglans is an indigenous cathartic resembling rhubarb in its property of evacuating without debilitating the bowels. Mild and efficient in its action, it is well adapted to *habitual constipation*. It may be given in decoction, or in the form of the official extract.]

JUNIPERUS—JUNIPER.

[The fruit of Juniperus communis, U. S.]

OFFICIAL PREPARATIONS, U. S.

Infusum Juniperi (berries ʒj. to Oj.). Dose, fʒiv.—Oj.

Oleum Juniperi. Dose, gtt. v.—xv.

Spiritus Juniperi Compositus (oil fʒjss. in Oviiij.).
Dose, fʒij.-iv.

Spiritus Juniperi (oil fʒj. in Oiiij.). Dose, fʒss.-j.]

Physiological Action.

Juniper stimulates the action of the kidneys, but, like many other remedies of its class, only increases the flow of urine where dropsy exists. It has been shown that in a healthy man the quantity of the urine is actually diminished, whilst the urea is increased.

[When an overdose is given, even strangury and total suppression may result. In small doses it is a gentle stimulant to the kidneys.]

Therapeutical Action.

Juniper is a good diuretic, generally used in combination with other drugs, and acting either when swallowed, or inhaled in the form of vapor.

R. Spiritus juniperi	fʒss. ;
Potassii acetatis	ʒjss. ;
Spiritus ætheris nitrosi	℥j. ;
Decocti scoparii [Br.]	fʒviiij. M.
S. Dose, fʒj. ter die	

Diuretic mixture.

KINO—KINO.

[*The inspissated juice of Pterocarpus Marsupium (De Candolle), and of other plants, U. S.*]

OFFICIAL PREPARATION.

Tinctura Kino (ʒjss. to Oj.). Dose, fʒj.]

Physiological Action.

Kino is astringent in virtue of the tannin which it contains.

Therapeutical Action.

It may therefore be used in *diarrhœa* and other cases where astringents are indicated, but it seems to have no special advantage over other remedies of the same class.

KRAMERIA—RHATANY.

[*The root of Krameria triandra (De Candolle), U. S.*

Dose, in substance, gr. xx.

OFFICIAL PREPARATIONS, U. S.

Extractum Krameriaë. Dose, gr. v.—x.

Extractum Krameriaë Fluidum. Dose, gtt. xx.

Infusum Krameriaë (3j. to Oj.). Dose, f3j.—ij.

Syrupus Krameriaë. Dose, f3ss.

Tinctura Krameriaë (3iij. to Oj.). Dose, f3j.—ij.]

Physiological Action.

Krameria has powerful astringent properties, due, no doubt, to the tannin which it contains. [It is also gently tonic, and is much esteemed in Peru in treatment of bowel affections.]

Therapeutical Action.

Rhatany has been used with success in *dysentery* and *diarrhœa*, but is probably inferior to many other remedies of the same class, and is therefore but seldom employed. [It is frequently added to chalk mixture, in the treatment of diarrhœa of relaxation.]

[LACTUCARIUM—LACTUCARIUM.

The concrete juice obtained from Lactuca sativa, by incision and spontaneous evaporation, U. S.

Dose, gr. xx.

OFFICIAL PREPARATION, U. S.

Syrupus Lactucarium (3j. to Oj.). Dose, f3ss.

Lettuce-opium is a feeble narcotic, and is considered slightly laxative and diuretic. It has been used as a substitute for the other narcotics in *phthisis* and in *diseases of children*.]

[LAVANDULA—LAVENDER.

The flowers of Lavandula vera (De Candolle), U. S.

OFFICIAL PREPARATIONS, U. S.

Oleum Lavandulæ. Dose, gtt. iij.—x.

Spiritus Lavandulæ. Dose, f3ss.—j. Enters into Mistura Ferri Composita.

Spiritus Lavandulæ Compositus. Dose, 3j.—iv.

Lavender is a carminative, but is rarely used except in combination. The compound spirit is its most elegant preparation, and is a very agreeable stomachic and cordial. The oil is used in perfumery.]

LEPTANDRA—LEPTANDRA.

The root of Leptandra Virginica, U. S.

Culver's root is emetic and cathartic, and is also considered cholagogue. Dose of the powdered root, gr. xx. to ʒj. In small doses (gr. ij.-v.), it is said to resemble rhubarb. The fluid extract (not officinal) is aperient in doses of ℥x. to ʒj.]

LIMONES—LEMON.

[The fruit of Citrus Limonum, U. S.]

Limonis Cortex. Lemon Peel.

Limonis Succus. Lemon Juice. Dose, fʒj.-iv.

Oleum Limonis.

Acidum Citricum.

OFFICIAL PREPARATIONS, U. S.

Spiritus Limonis. Used for flavoring purposes.

Mistura Potassii Citratis. Neutral Mixture. Dose, fʒj.-ij.

Syrupus Limonis. As a vehicle.

Spiritus Ammoniae Aromaticus. Dose, fʒss.-j.

Syrupus Acidi Citrici. As a vehicle.]

CONSTITUTIONAL ACTION.

Lemon-peel is in some measure tonic and antispasmodic, and is a useful flavoring ingredient, but lemon-juice has some important properties which are purely therapeutical, and cannot be explained by any action which it possesses over the healthy organism.

In the first place we must rank its antiscorbutic virtues, acting as it does both by preventing and by curing the disease, and by its universal use afloat almost stamping out the ravages of what used to be an almost invariable attendant on long voyages at sea. The occurrence of *scurvy* to any extent on board ship is now looked upon as a clear indication that the regular administration of lime or lemon juice has been neglected, and that the crew has been at-

tacked by a painful and dangerous disease, the absolute preventability of which experience has amply confirmed. Various explanations have been given of the cause of scurvy, and there is no doubt that it is usually associated with an absence of fresh meat and vegetables from the diet scale. Dr. Garrod, however, goes further, and teaches that the essence of the disease lies in a deficiency of the potash salts; whilst Mr. Morgan, of Dublin, is no less convinced that the absence of phosphoric acid is the real cause—both agreeing in this, however, that the presence of this special ingredient in lemon-juice explains its superiority over citric acid, which is in no degree an antiscorbutic. It is unfortunate that lime-juice is bulky, and liable to become solid at low temperatures, and must be also administered in such considerable doses as to give some excuse for its occasional neglect on expeditions where every ounce of extra weight entails increased toil and danger. It is to be hoped that some more convenient and portable means of using this invaluable drug may yet be introduced.

Lemon-juice was formerly vaunted as a specific for *acute rheumatism*, and although this has not been confirmed by experience, there is no doubt that persons afflicted with *chronic rheumatic pains* may often derive benefit from taking a tablespoonful of this agreeable remedy two or three times a day with their meals. Lemon-juice has also been called a refrigerant, but its sole claim to this title rests upon the great facility with which we may construct refreshing effervescing draughts by its aid.

[Linimenta.

The officinal Liniments are :—

Linimentum Aconiti	Linimentum Chloroformi
“ Ammoniae	“ Plumbi Subacetatis
“ Calcis	“ Saponis
“ Camphoræ	“ Terebinthinæ]
“ Cantharidis	

LINUM—FLAXSEED.

[*The seed of Linum usitatissimum*, U. S.

Oleum Lini. Flaxseed oil (Linseed oil).

Lini Farina. Linseed meal.

OFFICIAL PREPARATIONS, U. S.

Infusum Lini Compositum. As a demulcent. Dose, f3j.-iv.

Ceratum Resinæ Compositum. Deshler's Salve.

Linimentum Calcis. Carron oil. For burns.]

LOCAL ACTION.

Physiological.

Linseed meal, in the form of poultice, is the most convenient and effectual way of applying continuous moist warmth to the surface of the body. Thus used, it relieves pain, relaxes spasm, and is generally soothing and agreeable to the feelings of the patient. By relaxing the superficial vessels, a poultice may be in some measure antiphlogistic, and may also relieve the congestion of internal organs by drawing blood to the cutaneous surface and promoting perspiration there.

Therapeutical.

A linseed poultice is a very soothing and effectual application in all acute affections of the lungs. Not only does it relieve pain, but it keeps up a warm equable temperature, and rests the affected organ by restricting in some degree the movements of the chest walls. It may also be used with advantage in *peritonitis*, in *colic*, in various inflammatory affections of the throat, and in *boils*, *abscesses*, &c., where, if it does not succeed in arresting the suppurative process, as occasionally happens, it facilitates and hastens the breaking down of inflammatory products into pus, and thus encourages the process of ripening. After the opening of the abscess, poultices cannot be recommended, as they are nauseous and dirty, and we would much rather advise the case to be treated on the antiseptic principles of Mr. Lister.

Linseed oil is an old-fashioned treatment for *burns*, and, combined with lime-

water, was formerly extensively used under the name of carron oil.

INTERNAL USE.

An infusion of linseed is rather soothing in character, probably owing to the mucilage which it contains. Under the name of linseed tea, this infusion is much used in domestic medicine as a soothing remedy for coughs.

MODE OF ADMINISTRATION.

When used as an application in pleurisy or pneumonia, a poultice must extend fairly round the chest, must be at least half an inch thick, and must be changed not seldomer than every two hours, as it soon tends to become dry, hard, and uncomfortable. It is best made by boiling the meal for a few minutes, and afterwards incorporating with it a certain amount of olive oil, which prevents its adhering to the surface. Occasionally its use seems to irritate the skin, and cause a crop of small boils and painful pustules, and it must therefore, as a general rule, be avoided in moist cutaneous affections.

LITHIUM—LITHIUM.

[*Lithii Carbonas. Carbonate of Lithia. Dose, gr. iij. -vi.*

Lithii Citras. Citrate of Lithia. Dose, gr. v.-x.]

General Physiological Effects.

Lithia forms a very soluble salt with uric acid, probably in the blood, and therefore prevents the deposition of chalky formations in the tissues.

It also causes an increase in the urinary secretion.

Therapeutical.

Lithia is therefore a valuable remedy for *gout* and uric acid *gravel*, given either in the form of effervescing lithia water, *lithiæ carbonas*, or *lithiæ citras*.

It therefore acts as a diuretic perhaps more powerfully than any of the other alkaline salts.

LOBELIA—LOBELIA.

[*The leaves and tops of Lobelia inflata, U. S.*]

OFFICIAL PREPARATIONS, U. S.

Acetum Lobelia (f℥ij. to Oj.). Dose, from gtt. x. to f℥j.-ij.

Tinctura Lobelia (℥ij. to Oj.). Dose, from gtt. x. to f℥j.-ij.

ANTIDOTE.

The stomach should be washed out with warm solution of tannic acid, and symptoms of collapse treated as they arise, by stimulants, frictions, counter-irritants, sinapisms, and anodynes.]

LOCAL ACTION.

Lobelia possesses no local action.

INTERNAL ACTIONS.

*Physiological.**Therapeutical.*

1. *Brain and Nervous System.*—In large doses lobelia frequently causes headache and giddiness, and may eventually extinguish life by paralysing the respiratory centre.

2. *Heart and Circulation.*—Lobelia depresses the action of the heart, and in this respect has a powerful affinity to tobacco.

3. *Respiration and Temperature.*—As already mentioned, lobelia in large doses is a respiratory depressant, but in ordinary medical practice it seems to relieve spasmodic conditions of the bronchial tubes.

It lowers the temperature

3. Lobelia is only used in medicine in this country as a remedy for various respiratory affections, and more especially *spasmodic asthma*. Its action here is apt to be uncertain, and it may unexpectedly cause much nausea and discomfort; but

in some measure, on account of its diaphoretic action.

Ringer tells us that we may employ it with great confidence by giving much larger doses than are usually prescribed.

Remember that its action in no way prevents the asthmatic attack, but merely cuts it short.

4. *Secreting and Digestive Organs.*—Lobelia has undoubted emetic properties, and frequently causes vomiting, accompanied by much nausea and general depression.

4. Lobelia is never used as an emetic, being slow, uncertain [harsh], and exhausting.

Skin.—Lobelia excites the action of the skin.

Kidneys.—Lobelia is said to promote the excretion of watery fluids by the kidneys.

Dose.

Ringer tells us that the dose laid down in our usual text-books is much too small, and that we may freely administer a drachm of the ethereal tincture [same strength as tinct. lobelia, U. S.] every hour, or 10 minims every ten minutes, with advantage, immediately before and during the asthmatical paroxysm. [The vinegar of lobelia is the best preparation for internal use.]

The great drawback to its use is the occasional unpleasant symptoms following its administration, and which can be, unfortunately, neither foreseen nor prevented.

[Liquores.

The official Liquors are :—

Liquor Ammonii Acetatis	Liquor Ferri Citratis
" Arsenici Chloridi	" " Nitratis
" " et Hydrarg. Iodidi	" " Subsulphatis
" Barii Chloridi	" " Tersulphatis
" Calcii Chloridi	" Gutta-perchæ
" Calcis	" Hydrargyri Nitratis
" Ferri Chloridi	" Iodinii Compositus

Liquor Magnesii Citratis	Liquor Potassii Citratis
“ Morphiae Sulphatis	“ “ Permanganatis
“ Plumbi Subacetatis	“ Sodae
“ “ “ Dilutus	“ “ Chlorinatae
“ Potassae	“ Sodii Arseniatis
“ Potassii Arsenitis	“ Zinci Chloridi.]

[LYCOPODIUM—LYCOPODIUM.

The sporules of Lycopodium clavatum, and other species of lycopodium, U. S.

Lycopodium is an extremely fine, very light powder, of a delicate yellow color, inodorous, tasteless, and very inflammable, so that it flashes like gunpowder when thrown into the flame. It is used as a dusting powder for *excoriated surfaces*, and to coat pills in pharmacy.]

MAGNESIUM—MAGNESIUM.

[**Magnesii Carbonas.** Carbonate of Magnesia. Dose, \mathfrak{z} ss.- \mathfrak{z} j].

Magnesii Sulphas. Sulphate of Magnesia (Epsom salts). Dose, \mathfrak{z} ss.-j.

OFFICIAL PREPARATIONS, U. S.

Magnesia. Dose, \mathfrak{z} j.- \mathfrak{z} iv.

Trochisci Magnesiae (each containing gr. iij.).

Liquor Magnesiae Citratis. Dose, f \mathfrak{z} ij.-iv.]

INTERNAL USES.

Magnesia and its carbonate have a great capacity for saturating and neutralising acid, and secondly, on becoming converted into bicarbonate by the carbonic acid of the intestines, they produce a mildly laxative effect.

Sulphate of magnesia acts much more powerfully, and causes profuse watery evacuations, and its action may be thus explained:—

They are therefore antacid, and relieve pain or *heartburn*, and are also gentle purgatives, much used, more especially for children. Their tendency, however, to form concretions, when employed too long, limits their use in this respect.

Sulphate of magnesia is a very commonly used purgative in doses of from \mathfrak{z} j. to \mathfrak{z} ss. in simple constipation, in the early stages of small-

In virtue of its low diffusive power, it does not readily find its way into the blood, but, remaining in the intestines, it attracts and firmly retains the watery fluid it finds there, and thus prevents its reabsorption. But, in addition to this, recent experiment has shown that it also actually withdraws fluid from the veins, as proved by the rapid way in which a small portion of intestine isolated from the rest of the tube becomes filled with watery fluid after the introduction of sulphate of magnesia.

pox and feverish conditions, in *chronic lead-poisoning*, and, combined with iron, in many atonic conditions of the system.

MODE OF ADMINISTRATION.

As sulphate of magnesia is not only very nauseous, but, when taken alone, may cause griping, straining, or uncomfortable abdominal distension, it is usually prescribed in combination with senna, cardamoms, and liquorice, as in the *mist. sennæ co.* [Br.], or with a little acid and sulphate of iron, both of which seem to increase its purgative properties; and it is well to remember that free dilution also seems to enhance its effects. The following are good formulæ:—

- | | | |
|--|-------------|----|
| R. Magnesiae sulphatis | ℥ij.; | |
| Syrupi zingiberis | ℥ss.; | |
| Infusi rosæ [comp.] | ad f℥viiij. | M. |
| S. ℥j. tertiis horis. | | |
| R. Magnesiae sulphatis | ℥ij.; | |
| Ferri sulphatis | gr. xxiv.; | |
| Acidi sulphurici diluti | f℥ij.; | |
| Infusi quassiae | ad f℥viiij. | |
| Misce, fiat mistura, cujus capiat unciam unam omni mane. | | |
| R. Magnesiae sulphatis | ℥ij.; | |
| Magnesiae carbonatis | ℥ij.; | |
| Syrupi zingiberis | ℥ss.; | |
| Aquæ menthæ piperitæ | ad f℥viiij. | |
| Misce, fiat mistura. Sumat unciam unam quartis horis ad effectum, phialâ priùs bene agitâtâ. | | |

[MANGANESIUM—MANGANESE.

Manganesii Oxidum Nigrum. Black oxide of manganese (used in making oxygen, chlorine, and aqua chlorini) has been administered in doses of gr. iij.—xx.

Manganesii Sulphas. Sulphate of Manganese. Dose, gr. v.—xx.

INTERNAL EFFECTS AND USES.

Sulphate of manganese acts as a purgative in doses of ʒj.—ij., and in smaller doses has cholagogue properties. Dr. Hammond reports its successful use in *chorea*. In divided doses it has been given in *gastralgia*, *pyrosis*, and *indigestion*.]

MANNA—MANNA.

[*The concrete saccharine exudation in flakes of Fraxinus Ornus, and of Fraxinus rotundifolia, U. S.*]

INTERNAL EFFECTS AND USES.

Has very slight purgative properties. [It is generally given in infusion combined with senna, but may be used alone boiled in milk for children, to whom its sweet taste makes it acceptable. Dose, for a child, ʒj.—iij.]

[MARANTA—ARROWROOT.

The fecula of the rhizome of Maranta Arundinacea, U. S.

Enters into Trochisci Ipecacuanhæ.

USES.

Arrowroot is demulcent, and forms an agreeable article of diet for the sick and for infants. A tablespoonful to a pint of water, flavored with lemon and sugar, may be used for invalids, or a decoction in milk for children.]

[MARMOR—MARBLE.

Native, white, granular Carbonate of Calcium.

Used as a source for Carbonic Acid Gas and in making Aqua Acidi Carbonici, and Liquor Calcii Chloridi. (See Calcium.)]

[MARRUBIUM—HOREHOUND.

The leaves and tops of Marrubium vulgare, U. S.

Used as a domestic remedy for *catarrh*, in the form of decoction (℥j. to Oj.), syrup, and candy.]

MASTICHE—MASTIC.

[The concrete resinous exudation from Pistacia Lentiscus, U. S.]

Enters into Pilulæ Aloes et Mastiches.]

This is only used as a filling for decayed teeth in dental surgery.

MATICO—MATICO.

[The leaves of Artanthe elongata (Miquel), U. S.]

OFFICINAL PREPARATION, U. S.

Extractum Matico Fluidum. Dose, f℥ss.-j.]

Matico is only used externally as a local application for the arrest of *hæmorrhage*; and it is generally believed that it acts mechanically by the roughly-reticulated under-surface of the leaf entangling the blood and forming clots. No success has attended its internal administration. [In the form of the fluid extract, Matico has been highly recommended in *hæmorrhages* and diseases of mucous membranes, including *gonorrhœa* and *leucorrhœa*.]

[MATRICARIA—GERMAN CHAMOMILE.

The flowers of Matricaria Chamomilla, U. S.

Resembles chamomile in its properties, but is rarely used in America.]

[MEL—HONEY.

A saccharine liquid prepared by Apis mellifica, U. S.

OFFICINAL PREPARATION, U. S.

Mel Despumatum.

USES.

Enters into Confectio Aromatica, Confectio Opii, Confectio Rosæ, Oxymel (Br.), Mel Rosæ, Mel Sodii Boratis,

Pilula Ferri Carbonatis, Pilulæ Quiniæ Sulphatis, Tinctura Cardamomi Composita, and Tinctura Opii Composita.

The agreeable taste and demulcent qualities make honey a useful vehicle for distasteful powders, and render it an acceptable addition to gargles. Purified honey is a good excipient for pills, and forms the basis of the Mellitæ.¹

[MENTHA PIPERITA—PEPPERMINT.

The leaves and tops of Mentha piperita, U. S.

MENTHA VIRIDIS—SPEARMINT.

The leaves and tops of Mentha viridis, U. S.

OFFICIAL PREPARATIONS, U. S.

Aqua Menthæ Piperitæ. Used as a vehicle.

Oleum Menthæ Piperitæ. Dose, gtt. iij.—x.

Spiritus Menthæ Piperitæ. Dose, gtt. x.—xx.

Trochisci Menthæ Piperitæ.

Aqua Menthæ Viridis. Used as a vehicle.

Oleum Menthæ Viridis. Dose, gtt. iij.—x.

Spiritus Menthæ Viridis. Dose, gtt. x.—xx.

Peppermint and spearmint are favorite stimulant stomachics, and are much used as vehicles in mixtures. The troches of peppermint are a popular carminative.]

MEZEREUM—MEZEREON.

[The bark of Daphne Mezereum and of Daphne Gnidium, U. S.]

OFFICIAL PREPARATIONS, U. S.

Decoctum Sarsaparillæ Compositum. Dose, fʒiij.—iv.

Extractum Mezerei Fluidum (used in Ung. Mezerei).

Extractum Sarsaparillæ Compositum Fluidum.
Dose, ʒss.—j.

Unguentum Mezerei (a stimulant dressing).]

This drug is never used save as a constituent of the decoctum sarsaparillæ co.

¹ [The class of Mellitæ, or Honeys, comprises Mel Rosæ and Mel Sodii Boratis, which are used chiefly in washes for the throat and mouth.]

[Misturæ.

The officinal Mixtures are:—

Mistura Ammoniaci	Mistura Cretæ
“ Amygdalæ	“ Ferri Composita
“ Assafoetidæ	“ Glycyrrhizæ Composita
“ Chloroformi	“ Potassii Citratis.]

[MONARDA—HORSEMINT.

The leaves and tops of Monarda punctata, U. S.

OFFICINAL PREPARATION, U. S.

Oleum Monardæ. Dose, gtt. ij.—iij.

EFFECTS AND USES.

The oil is used in domestic practice for *sick stomach* and *flatulent colic*; like the other mints, it is stimulant and carminative. Applied to the skin it is rubefacient, even vesicant, and has been employed as counter-irritant in *chronic rheumatism, infantile paralysis, and in low fevers.*]

[MOSCHUS—MUSK.

A peculiar concrete substance obtained from Moschus Moschiferus, U. S.

INTERNAL EFFECTS.

Has undoubted antispasmodic powers, but has been almost entirely discarded on account of its high price and frequent adulteration. It may be given in doses of gr. v. —xv., in *hysterical convulsions, hiccough, in low fevers and delirium tremens*. Castoreum makes an efficient substitute for musk.]

[Mucilagines.

The officinal Mucilages are:—

Mucilago Acaciæ	Mucilago Tragacanthæ
“ Sassafras Medullæ	“ Ulmi.]

MYRISTICA—NUTMEG.

[*The kernel of the fruit of Myristica fragrans (Houttuyn, Nat. Hist.), U. S.*

OFFICINAL PREPARATIONS, U. S.

Spiritus Myristicæ. Dose, fʒj.

Oleum Myristicæ. Volatile Oil of Nutmegs. Dose, gtt. ij.—iij.

MACIS—MACE.

The aryllus of the fruit of Myristica fragrans (Houttuyn, Nat. Hist.), U. S.

Enters into Acetum Opii, Pulvis Aromaticus, Spiritus Ammoniae Aromaticus, Spiritus Lavandulae Compositus, Spiritus Rhei Aromaticus, Trochisci Cretæ, Trochisci Magnesiae, and Trochisci Sodii Bicarbonatis.]

Nutmeg is rarely used in medicine save as a flavoring ingredient. [The dose of Nutmeg or Mace in substance is gr. xv. With its aromatic qualities, nutmeg unites considerable narcotic power, and in doses of ʒij.-iij. has produced stupor and delirium.]

MYRRHA—MYRRH.

[A gum-resinous exudation from *Balsamodendron Myrrha* (Nees, *Beschreib. Officinel. Pflanzen*).]

Dose, in substance, gr. x.-xxx., U. S.

OFFICIAL PREPARATIONS, U. S.

Tinctura Myrrhæ (ʒjss. to Oj.). Dose, fʒss.-j.

Tinctura Aloes et Myrrhæ. Dose, fʒj.-ij.

Also enters into Mistura Ferri Composita, Pilulæ Aloes et Myrrhæ; Pilulæ Ferri Compositæ, Pilulæ Galbani Compositæ, and Pilulæ Rhei Compositæ.]

LOCAL USES.

Physiological.

Myrrh is astringent, and checks excessive secretion from mucous surfaces.

Therapeutical.

It is a useful addition to gargles in relaxed or ulcerated conditions of the throat; it is a good application to spongy or unhealthy gums, as in mercurial salivation; and it often forms one of the active constituents of lotions for foul ulcers, where it gently stimulates the granulating surface, and corrects the fœtor of discharges.

INTERNAL USES.

Like all the gum balsams and resinous substances, myrrh may possess in some degree the power of stimulating mucous surfaces. Tradition and the habit of prescribers have also invested it with some supposed influence over the uterus; but no trustworthy evidence has ever been brought forward on this point, and it is more than probable that its emmenagogue influence is quite secondary to the other drugs in combination with which it is prescribed in these cases.

Myrrh has occasionally been used as a stimulant in *chronic bronchitis*, but practically its application in medicine is now restricted to the administration of the various forms of pill in *amenorrhœa*; and here it is impossible to separate its action from the aloes with which it is invariably combined.

R. Aluminis	℥ij.;
Tincturæ myrrhæ	f℥ij.;
Infusi rosæ [comp.]	ad f℥x.
Misce, fiat gargarisma.	

NECTANDRA—BEBEERU BARK.

[*The bark of Nectandra Rodiei* (Schomburgh), U. S.]

The bebeeru bark possesses some of the physiological properties of quinine. Thus it arrests the movements of the white blood-corpuscles, and checks the development of bacteria; but unfortunately it does not in any way fulfil the same therapeutical indications, save acting as a tonic, in virtue of its bitterness.

[Like cinchona, it contains several alkaloids, the principal one having received the name of *beberia*, a sulphate of which is officinal in the Ph. Br., but not officinal in the United States. The antiperiodic dose of the sulphate of *beberia* is gr. xx.-℥j. (It should not be confounded with *berberina*, the active principle of the simple bitters.)]

NUX VOMICA—NUX VOMICA.

[*The seed of Strychnos Nux Vomica, U. S.*

OFFICINAL PREPARATIONS, U. S.

Tinctura Nucis Vomicae (℞iv.—Oj.). Dose, ℥x.

Extractum Nucis Vomicae. Dose, gr. $\frac{1}{4}$ to $\frac{1}{2}$.

Strychnia and Strychniae Sulphas. Dose, gr. $\frac{1}{36}$ — $\frac{1}{8}$.]

ANTIDOTES.

In a case of strychnia poisoning, we may first administer tannin, which places the drug in an insoluble form, then, after evacuation of the stomach, it will be necessary to try the physiological antidotes. These are chloral, bromide of potassium, Calabar bean, and nicotia [or tobacco enemata], although the use of the last-mentioned remedy must be conducted with extreme caution. Finally, we may have recourse to artificial respiration.

LOCAL ACTION.

No special local action has been noted.

CONSTITUTIONAL ACTION.

1. *Brain and Nervous System*.—No effect is produced on the brain, the cerebral functions remaining unimpaired almost up to the close of a case of strychnia-poisoning.

The spinal cord, however, is early attacked, and violent and distressing tetanic spasms prove the irritating influence of the drug, more especially on the reflex excitability of that organ.

In large doses, strychnia also paralyses the efferent (motor) nerves, causing loss of power of voluntary movement.

The sympathetic system is stimulated.

1. Nux vomica, and more especially strychnia, are excellent nervine tonics, acting well in simple *debility, nervous exhaustion, and incontinence of urine*, and promoting the return of function after some forms of paralysis. When all inflammatory symptoms have subsided, strychnia may be prescribed in the hope of stimulating the spine to resume its duties, and restoring tone to muscles which long remained

in a state of inactivity. Thus, in *paraplegia*, *hemiplegia*, *diphtheritic paralysis*, and *wrist-drop*, strychnia may well go hand in hand with galvanism when all evidence of irritation of the nervous structures has completely disappeared. Mr. Barwell has proposed subcutaneous injections of strychnia in infantile paralysis, using a large dose ($\frac{1}{16}$ to $\frac{1}{12}$ gr.), and forcing the fluid freely into the muscular structures. [To begin with, a much smaller dose should be exhibited. One-half a grain, by the mouth, has killed an adult.]

2. Heart and Circulation.

Strychnia causes rise of arterial pressure and contraction of the capillaries.

3. *Respiration and Temperature*.—The interference with breathing observed in strychnia-poisoning, and which usually terminates the life of the victim, is due to spasmodic fixation of the diaphragm and respiratory muscles.

4. *Digestive and Secreting Organs*.—Strychnia has a tonic influence over the digestive process.

4. Strychnia, and more especially *nux vomica*, are excellent tonics, improving the appetite in a marked degree; but, in addition to this, *nux vomica* is of great service in various *dyspeptic conditions*, relieving *heart-burn*, *nausea*, and *flatulence*, and being also a reliable

remedy in *sick headache* and the *vomiting of pregnancy*. It is an excellent addition to purgative pill masses, improving the tone of the muscular wall of the intestines and relieving constipation.

POISONOUS EFFECTS.

As already stated, strychnia kills by inducing hyperexcitability of the reflex functions of the spine, with violent tetanic spasms, leading to death by exhaustion or suffocation. The fatal event may take place in a few minutes if the dose be a large one, and the minimum quantity required to destroy life is about half a grain. Contrary to the habit of other poisonous drugs, strychnia acts most rapidly and efficiently when given by the rectum.

DOSE, MODE OF ADMINISTRATION, &c.

The dose of strychnia may be put at from $\frac{1}{30}$ to $\frac{1}{2}$ gr., and the liquor is a convenient form, in doses of from 5 to 10 minims, added to any ordinary tonic mixture. We are usually advised to suspend its administration from time to time, as it is stated that uncomfortable twitchings and rigidity about the jaw may suddenly arise, giving evidence of the so-called 'accumulation' of the drug.

The dose of nux vomica is, of the tincture 5 to 10 minims, of the extract gr. $\frac{1}{4}$ to gr. ij.

By hypodermic injection we are usually taught that gr. $\frac{1}{20}$ is the proper dose, and it is therefore difficult to explain why no poisonous results followed Barwell's somewhat heroic medication.

R. Ferri sulph. exsic.	gr. xl. ;
Quiniae sulph.	gr. xl. ;
Strychniæ sulph.	gr. ss. ;
Mannæ	q. s. M.
Fiant pilulæ xx. Sumat unam ter die.	

A useful tonic pill.

R. Tinct. nucis vomicæ	f℥j. ;
Acidi [nitro-muriatici] diluti	f℥ij. ;
Spiritus chloroformi	f℥j. ;
Infusi gentianæ	ad f℥vj. M.
S. Dose, f℥j. ter die sumend.	

For *flatulent colic*, taken after meals.

R. Ferri sulph.
 Ext. nucis vomicæ ũā gr. ss.;
 Ext. aloes Barb. gr. iij. M.
 Fiat pil. ante cibum sumend.

A good "dinner pill."

[Olea.

The officinal Oils are:—

Oleum Æthereum	Oleum Menthæ Viridis
" Amygdalæ Amaræ	" Monardæ
" " Expressum	" Morrhuæ
" Anisi	" Myristicæ
" Bergamii	" Olivæ
" Cajuputi	" Origani
" Camphoræ	" Pimentæ
" Cari	" Ricini
" Caryophylli	" Rosæ
" Chenopodii	" Rosmarini
" Cinnamomi	" Rutæ
" Copailbæ	" Sabinæ
" Cubebæ	" Sassafras
" Erigerontis Canadensis	" Sesami
" Fœniculi	" Succini
" Gaultheriæ	" " Rectificatum
" Hedeomæ	" Tabaci
" Juniperi	" Terebinthinæ
" Lavandulæ	" Theobromæ
" Limonis	" Thymï
" Lini	" Tiglii
" Menthæ Piperitæ	" Valerianæ.]

[OLEUM ÆTHEREUM—ETHEREAL OIL, U. S.

Heavy oil of wine is a limpid, almost colorless, volatile fluid, of a pungent taste and vinous odor. Its solution in alcohol and ether is officinal as Spiritus Ætheris Compositus (see page 91), but it is never prescribed alone.]

OLEUM MORRHUA—COD-LIVER OIL.

[The fixed oil obtained from the livers of *Gadus Morrhua* and of other species of *Gadus*, U. S.]

LOCAL ACTION.

Cod-liver oil is not used in virtue of any local action, as its nauseous smell effectually prevents it from forming the basis of ointments or liniments. Being very readily

absorbed by the skin, however, it is occasionally introduced into the system by this channel when the patient is unable to take it by the mouth. [It has been used in ophthalmic practice, instilled into the eye, to remove slight opacity of the cornea.]

CONSTITUTIONAL ACTIONS.

Physiological.

1. *Brain and Nervous System.*—Cod-liver oil can only be said to act on the nervous system by improving its nutrition and supplying the fatty ingredients necessary for growth and repair.

2. *Circulation.*—It has a tonic influence on the circulating organs, by improving the quality of the blood and strengthening the heart-muscle.

3. *Respiration and Temperature.*—No special physiological influence is exerted on either of these functions. [In addition to its value as a hydro-carbon in simply nourishing the body, it is alterative by virtue of a small proportion of iodine, bromine, and phosphoric acid which it contains, associated with certain biliary principles, in a manner, perhaps, best adapted to secure their absorption and assimilation.]

4. *Digestive and Secreting Organs.*—It has been proved by experiment that animal

Therapeutical.

1. It is therefore specially indicated in all nervous affections dependent on debility, such as *neuralgia*, some forms of *insanity*, *asthma*, *whooping-cough*, &c.

2. It is therefore much used in *simple debility*, in *convalescence* from acute illness, in *anæmia*, and other weakened conditions of the system.

3. Under this heading we may place, for convenience, the wonderfully restorative effects of cod-liver oil in *chronic lung disease*, but more especially in the various forms of *pulmonary phthisis*. It is beneficial in *asthma* and *chronic bronchitis*, but in *consumption* it really seems to be directly curative. It may be given with advantage in all stages, and under its use patients often rapidly gain flesh, and not only manage to hold the disease at bay, but even occasionally seem to escape from its clutches.

4. Cod-liver oil is most invaluable in diseases depending on defective nutri-

are much more digestible than vegetable oils, and cod-liver oil is the most readily assimilated of all. After being emulsified by the pancreatic juice, it comes in contact with the bile, which distinctly increases its power of passing through moist animal membranes; and it is probable also that the biliary principles incorporated in its own structure aid in enabling it to be easily absorbed by the lacteals. Its action on the system now is to improve the general constitutional tone, to evolve force and heat, and to aid in supplying those fatty elements which are so essentially requisite for the construction and repair of the tissues.

Cod-liver oil occasionally causes nausea, vomiting, and diarrhoea, and it has been shown to increase in some measure the biliary secretion.

MODE OF ELIMINATION.

The greater part of the oil is absorbed into the system, but a little is given off by the fæces; and it is well to watch the evacuations of children under its influence, to see whether any undigested oil escapes, this indicating an overdose.

DRAWBACKS. MODE OF ADMINISTRATION.

Cod-liver oil occasionally produces so much nausea, eructation, and discomfort, as to compel us to suspend its administration; but most patients, and more especially children, speedily grow accustomed to its use. It is advisable to prescribe it in small doses directly after meals or at bed-time, to give it with some light tonic, and to

tion, as in all scrofulous conditions, such as *strumous ophthalmia*, *caries of bones*, *chronic joint-affections*, *glandular enlargements*, &c.; also in *rickets* and all the wasting disorders of childhood, in senile atrophy and decay, in *chronic rheumatism*, in all the ulcerative varieties of *skin disease*, and in advanced *constitutional syphilis*. Various attempts have been made to explain the actions of the oil by means of certain special ingredients which it contains; but none of these have been successful, and we cannot at present do more than attribute its restorative influence to its ready digestibility and nutritive properties.

suspend it from time to time, more especially in hot weather or when bilious symptoms supervene. It may well be given in combination with a little alcohol, beaten up with the froth of porter, with mucilage, or lemon-juice, or with from ℥x. to f℥j. of æther purus, which, Dr. B. Foster tells us, aids digestion by stimulating the pancreatic secretion; but if the pale oil is used, very few persons will be found entirely rebellious to its use. Children, as a rule, take it well, but if they prove obstinate we may give it with orange wine, or in the following combination:—

R. Olei morrhue	f℥ss.;
Mucilaginis acacie	f℥ij.;
Sacchari	℥ij.;
Tincturæ lavandulæ comp.	℥xx.;
Aquæ	f℥ss. M.
f℥j. pro dosi.	

Black coffee forms a good medium for adults, or we may give the oil floating [on beer, porter, or] on the following mixture:—

R. Acidi nitrici diluti	℥x.;
Acidi hydrocyanici [dilut.]	℥j.-ij.;
Tincturæ aurantii	f℥ss.;
Aquæ	f℥ss. M.

The dose should never exceed half an ounce.

[A pancreatic emulsion of cod-liver oil, and an emulsion with the lacto-phosphate of lime, or with lime-water (soap) flavored with oil of bitter almonds, are largely used for children, although not official.]

OLEUM OLIVÆ—OLIVE OIL.

[The fixed oil obtained from *Olea Europæa*, U. S.

Olive oil is nutritious and laxative, and is occasionally used for children as a substitute for castor oil. Dose, for an adult, f℥ij.-iv. It is a useful remedy for all kinds of irritant poisoning except from PHOSPHORUS in substance. It is used largely in pharmacy.]

Olive oil is only used externally as an emollient application, and as the basis of various liniments.

OLEUM RICINI—CASTOR OIL.

The fixed oil obtained from the seeds of *Ricinus communis*, U. S.

Enters into the Official Preparations, Collodium cum Cantharide and Collodium Flexile.

EXTERNAL USES.

Castor oil is a substance of such bland and unstimulating quality, that, were its smell less offensive, it might form a valuable external agent in certain cases. It is, however, occasionally used as a soothing application to the eye when extreme temporary irritation has been set up by abrasion of the corneal epithelium. Castor oil will purge when rubbed into the skin.

INTERNAL USES.

Physiological.

Castor oil gently stimulates the peristaltic movements of the intestinal canal, and slightly augments the fluid secretions of the gut. Some amount of astringent action generally follows the purgative action of the drug.

The seeds are very irritating, and cause gastrointestinal irritation, three having proved fatal to an adult.

Therapeutical.

Castor oil is a mild and efficient cathartic, emptying the intestines without causing griping or discomfort. It is therefore useful in all cases where we simply wish to unload the bowels; but it is not a good habitual purgative from the subsequent constipation produced. This astringent action, however, gives it a special advantage in the treatment of *diarrhœa*, many cases of which depend on the presence of irritating matters in the intestinal canal; and under such circumstances, common sense naturally indicates the propriety of expelling the exciting cause. Dr. Geo. Johnson, however, goes further than this, and advocates the "eliminative" treatment of all *diarrhœas*, as well as cholera.

DOSE AND MODE OF ADMINISTRATION.

Although the best castor oil has but little actual flavor, it leaves a greasy, sickly sensation on the palate, which is

exceedingly unpleasant. It is therefore important to give it in some form of combination, and we find floating the dose in a glass between two strata of whiskey or brandy [and cinnamon water] to be an effectual plan, or we may make use of the following formulæ:—

R. Ol. ricini f ℥ss.;
 Mucilaginis acaciæ,
 Syrupi simplicis āā f ℥ij.;
 Aquæ cinnamomi ad f ℥ij. M.
 Fiat haustus statim sumendus.

R. Ol. ricini f ℥ij.;
 Tinct. opii ℥x.;
 Syrupi zingiberis f ℥j.;
 Aquæ menth. pip. ad f ℥ij. M.
 Fiat haustus statim sumendus.

A good prescription for the diarrhœa of irritation.

[OLEUM SUCCINI—OIL OF AMBER.

The volatile liquid obtained by the destructive distillation of amber, U. S.

OFFICIAL PREPARATION, U. S.

Oleum Succini Rectificatum. Dose, gtt. x.—xx.

The oil of amber is stimulant and antispasmodic, and has been recommended in *bronchitis*, *hysteria*, and obstinate *hiccough*, and is also used externally, diluted with sweet oil, as a sedative and rubefacient for *whooping-cough*, or for *infantile convulsions*, as in the mixture recommended by Dr. Jos. Parrish:—

R. Olei succini rectificati,
 Tincturæ opii āā f ℥ss.;
 Olei olivæ,
 Spiritus vini gallici āā f ℥ij. M.
 Fiat lotio.

To be rubbed along the spine.]

OLEUM THEOBROMÆ—CACAO BUTTER.

[The concrete oil of the kernels of the fruit of Theobroma Cacao, U. S.]

Oil of theobroma, being a firm, solid, and agreeable substance, is much used in the manufacture of suppositories.

[Suppositoria.

The officinal Suppositories are:—

Suppositoria Acidi Carbolici	(each gr. j.)
“ “ Tannici	“ gr. v.
“ Aloes	“ gr. v.
“ Assafoetidæ	“ gr. v.
“ Belladonnæ	“ gr. ½ extract.
“ Morphine	“ gr. ½.
“ Opii	“ gr. j. extract.
“ Plumbi	“ gr. iij. plumbi acetatis.
“ Plumbi et Opii	“ gr. iij. plumbi acetatis and gr. ½ extract. opii.]

[OLEUM THYMI—OIL OF THYME.

The volatile oil obtained from Thymus vulgaris, U. S.

Thyme is said to furnish the commercial oil of origanum. It is aromatic and counter-irritant, the oil being used almost exclusively as a local application, and is an ingredient in *opodeldoc*, the linimentum saponis camphoratum of former editions of the Pharmacopœia.]

OLEUM TIGLII—CROTON OIL.

[*The fixed oil obtained from the seed of Croton Tiglium, U. S.*]

LOCAL ACTION.

Physiological.

The topical application of croton oil to the skin causes a good deal of irritation, followed by the appearance of a copious crop of papules, gradually developing into pustules. Dr. Tilbury Fox has described a symmetrical erythema of the face following this local employment; and it is said that the addition of an alkali favors the development of the counter-

Therapeutical.

The local application of liniments containing croton oil was in former years a favorite mode of using counter-irritation in various chronic lung-affections, and it is still employed, more especially in public practice. But its drawbacks are, that it has a tendency to overact on tender or irritable skins, and the pustules are liable to leave cicatrices, so that it

irritant properties of the drug. is difficult to believe it in any way superior to other and milder applications.

INTERNAL ACTION.

When taken internally, croton oil produces much irritation of the intestines, running on, if the dose be sufficiently large, into a very fair imitation of the symptoms of cholera-poisoning, with vomiting, extreme purging, collapse, and acute inflammation of the intestines.

Croton oil, then, is a drastic purgative, valuable in certain cases on account of its rapid and powerful action. Thus in *apoplexy* and other *cerebral affections*, where it is of importance to obtain an immediate and thorough evacuation of the bowels, and in some conditions of obstinate constipation, we find considerable advantage from its cautious use.

MODE OF ADMINISTRATION, &c.

Croton oil has an acrid and irritating flavor, and is best given in the form of pill [or rubbed up with sugar]. Garrod, however, tells us that it may well be prescribed in combination with castor oil, and, in case the patient is unable to swallow, it may be placed on the back of the tongue.

In an extreme case we might expect to obtain some purgative effect from rubbing it into the skin, as it appears to act by absorption through this channel.

R.	Olei crotonis	℥ij. ;
	Misce panis	q. s. M.
	Fiat pilula, statim sumenda, et horis duabus repetenda	
	si opus sit.	

Or we may endeavor to keep its irritating properties in check by prescribing it in the following combination :—

R.	Ol. crotonis	℥iij. ;
	Ext. colocynth. comp.	gr. xx. ;
	Ext. belladonnæ	gr. iij.
	Misce, divide in pil. vj., quarum sumat unam si opus sit.	

For external use, a very good liniment is contained in the British Pharmacopœia.

OPIUM—OPIUM.

[The concrete juice obtained from the unripe capsules of *Papaver somniferum*, by incision and spontaneous evaporation. U. S.]

OFFICINAL PREPARATIONS, U. S.

Acetum Opii (black drop) (gr. j. in ℥vjss.). Dose, ℥v.-vij.

Confectio Opii (gr. i in 36). Dose, ʒss.

Extractum Opii (double strength of opium). Dose, gr. ss.

Emplastrum Opii (extract i in 16).

Suppositoria Opii (extract of opium gr. ss.).

Suppositoria Plumbi et Opii (plumb. acet. gr. iij. ; opium ext. gr. ss.).

Pilulæ Opii (each, gr. j.).

Pilula Saponis Composita (mass 20 per cent. opium).

Pulvis Ipecacuanhæ Compositus (Dover's Powder, gr. i in 10). Dose, gr. x.

Tinctura Opii (gr. j. in ℥xij.). Dose, ℥xij.

Tinctura Opii Acetata (gr. j. in ℥x.). Dose, ℥x.

Tinctura Opii Camphorata (gr. j. in fʒss.). Dose, fʒj. to iv.

Tinctura Opii Deodorata (gr. j. in ℥xij.). Dose, ℥xij.

Trochisci Glycyrrhizæ et Opii (gr. i in 20).

Trochisci Morphizæ et Ipecacuanhæ (each, gr. ʒss.).

Liquor Morphizæ Sulphatis (gr. j. in fʒj.). Dose, fʒj.

Suppositoria Morphizæ (each, gr. ss.).

Vinum Opii (gr. j. in ℥viiij.). Dose, ℥viiij.

Morphia { **Morphizæ Acetas** }
 { **Morphizæ Murias** } Dose, gr. ʒss-1.
 { **Morphizæ Sulphas** }

ANTIDOTES.

When summoned to a case of opium poisoning, the first indication must be to evacuate the stomach, and this is best effected by the stomach-pump, as the vomiting centre is too much paralysed by narcosis to allow of its effective stimulation by emetics. We then try to counteract the tendency to sleep by cold affusion, irritation of the skin, strong coffee, galvanism, and walking the patient about, and finally we may cautiously use atropine as the physiological anti-

dote. Although some good evidence comes to us from China of opium-poisoning checked by the antagonistic action of atropine, reports and opinions differ much on this head, and some authorities hold that atropine in certain proportions may even intensify the action of morphia.

Professor Bennett believes that atropia may be of service by contracting the vessels of the brain, and limiting the tendency to cerebral congestion.

As a last resource, we may have recourse to artificial respiration.

LOCAL ACTION.

Physiological.

It seems very doubtful whether opium can be absorbed through the unbroken cuticle. We are told that opium inspectors in India will remain for hours with their arms plunged up to the elbows in the inspissated extract, and that no narcotic effect is produced; but it is difficult, on the other hand, to believe that opium is entirely devoid of a property which belladonna possesses in so remarkable a degree. Sir Henry Thompson is also strongly of opinion that the bladder cannot absorb opium.

Therapeutical.

Fomentations with the decoction of poppy-heads, and with other preparations of opium, have long been recognized as efficient means for the relief of pain in various inflammatory conditions, as hæmorrhoids, erysipelas, conjunctivitis, &c.; but as we cannot bring forward evidence of absorption of the drug, we must merely attribute this soothing influence to the thorough application of moist heat.

INTERNAL ACTIONS.

I. *On Nervous System.*—
1. *Brain.*—In small quantity, or in a less degree as the occasional preliminary action of a truly narcotic dose, opium is gently exciting to the brain, the intellectual faculties becoming generally

I.—1. Opium, being the most certain narcotic known, is very largely prescribed in a great variety of cases. In *simple insomnia*, in worn-out conditions of the nervous system, in *acute fevers*, such as *typhus* and *typhoid*, where

stimulated, and the imagination more vivid. To this, however, rapidly succeeds a dulling or deadening effect, drowsiness supervenes, and deep sleep finally sets in, from which the patient wakes within a period of time proportioned to the quantity of the drug administered. Headache, dryness of the mouth, and digestive disturbance are frequently experienced, and idiosyncrasy may in some rare cases interfere materially with sleep by bringing into special prominence the exciting or stimulating properties of opium. It is not quite clear in what precise way the narcotising influence is in this instance produced; but analysis would lead us to believe that contraction of the cerebral vessels imitates natural sleep by inducing an anæmic condition of the grey matter of the brain. The resulting contraction of the pupil is probably central in origin, as it cannot be produced by any local application of opium in any form.

2. The conductivity and irritability of the sensory nerves are much diminished, so that pain is felt with less intensity.

delirium and sleeplessness constitute truly dangerous complications, in *delirium tremens*, in the later stages of severe *smallpox*, in *meningitis*, *acute mania*, and in numerous other diseased conditions, which the reader can readily recall, this invaluable drug does most essential service by procuring sound and refreshing sleep.

2. And even when not given in truly narcotic doses, it may also lull the sufferer into slumber by benumbing the sensory nerves and removing pain. As a sedative, anodyne, or analgesic, it is indispensable in many painful conditions, such as *neu-*

ralgia, sciatica, cancer, biliary or renal calculi, labor after-pains, colic, &c., and, as we shall presently see, the subcutaneous injection of morphia is the most effectual, as it certainly is the most rapid and convenient, mode of obtaining this action of the drug.

Opium is also an excellent antispasmodic, and acts well by relieving irregular muscular contraction, as in the intestine causing *colic*, in the uterus tending to abortion or exhausting *after-pains*, in *spasmodic urethral stricture*; and its remarkable influence over some forms of obstinate ulceration must also be due to some nervous influence.

3. The reflex function of the spinal cord is at first slightly increased, but subsequently becomes lessened in degree, and the respiratory centre is weakened and finally paralysed. In cold-blooded animals, as the frog, in which the cerebral are subordinated to the spinal functions, opium causes most violent tetanic convulsions. [This happens occasionally in children.]

4. The sympathetic system of nerves is also primarily excited, and secondarily depressed.

II. *Vascular System.*—The action of the heart is at

3. Opium, having the property of arresting the muscular action of various organs, is our sheet-anchor in those terrible cases where *rupture of the intestine, bladder, or uterus*, has occurred, and where the only possible chance of recovery consists in most perfect rest of the viscus, encouraging the healing process, and preventing the escape of irritating secretions into the peritoneal cavity.

II. The subcutaneous injection of morphia has been

first slightly quickened, but afterwards its beats become slower, the pulse fuller and firmer, and the arterial tension raised, this effect being considered due to an influence on the cardiac inhibitory nerves. It is noted, however, that shortly before death, in cases of opium-poisoning, the pulse becomes feeble, rapid, and irregular. The stimulating action on the sympathetic nerves causes some contraction of the smaller vessels to accompany the use of moderate doses of opium.

III. *Respiration and Temperature.* — The breathing tends to become slow from the paralyzing influence of opium on the respiratory centre, and at the same time the secretion from the bronchial tubes is lessened.

The temperature at first rises a little, but finally falls when sweating is established.

IV. *Digestive and Secreting Organs.* — 1. Nausea occasionally follows the use of opium, and constipation invariably results from diminution of the intestinal secretions, no less than arrest

advised by Dr. Clifford Allbutt in *angina pectoris*, *palpitation*, and various painful cardiac conditions. Its contracting influence on the small vessels explains the antiphlogistic effect of opium in cases of *peritonitis* and other inflammatory conditions, as well as its power of checking *coryza* in its early stage. It also acts well as an astringent in some forms of *hæmorrhage*, and more especially that from the lungs.

III. Opium is the most soothing remedy for coughs of all kinds, but more especially that of *phthisis*. It is a valuable aid in *spasmodic asthma* and the early stages of *acute pneumonia*, but in the later stages we must beware of its power of checking secretion, and in *bronchitis* it may do harm by slowing the respiratory movements, causing sleep to interfere with the due emptying of the bronchial tubes, and thus leading on to imperfect aeration of the blood and final suffocation.

IV.—1. Opium is an excellent astringent in *diarrhœa*, *dysentery*, and British [or sporadic] *cholera*, often succeeding where other remedies fail, and for the relief of pain and tenesmus,

of the peristaltic movements of the canal.

2. The salivary secretion is also diminished, causing dryness of the tongue.

3. The urine is lessened in quantity, but opinions differ as to the effect produced on its solid ingredients.

4. The biliary secretion is checked.

5. The secretion of the skin is increased, perspiration generally resulting, and we may say generally that opium checks all secretions but that of the skin.

nothing is better than the enema of the [Br.] Pharmacopœia. In the *diarrhœa* of ulcerative processes, such as typhoid and phthisis, and the later stages of *dysentery*, it is truly invaluable.

3. Opium is of great service in some cases of *diabetes*, checking the craving appetite, and lessening the secretion of sugar.

We must beware of its use, however, in advanced cases of renal disease, where it acts injuriously by checking secretion and encouraging the retention of urea in the blood.

5. Opium in some forms, and more especially Dover's powder, acts as an efficient diaphoretic.

POISONOUS ACTION.

When opium has been given in a poisonous dose, the resulting sleep gradually grows deeper, the breathing becomes heavy and stertorous, the face is flushed, swollen, and dusky, the pupils contracted to mere points, distension of the right side of the heart still further prevents the return of blood from the engorged lungs, and paralysis of the respiratory centre finally causes death by suffocation. Much difficulty may occasionally attend the diagnosis of opium-poisoning from (1) alcoholic coma, where, however, the pupils are usually dilated; (2) from uræmic coma, where an examination of the urine, if practicable, might clear

up our doubts; and (3) from apoplectic effusion in the pons Varolii, where the symptoms are usually so similar as to render an absolute diagnosis, under certain circumstances, impossible. After death we find well-marked congestion of the brain.

CAUTIONS AND MODES OF ADMINISTRATION.

In giving opium we must remember that human beings, like the lower animals, are diversely susceptible to its influence. Thus ducks and pigeons can swallow large quantities with impunity, whilst the horse and the dog rapidly fall under its influence; and although we can hardly lay down any general rules to guide us in practice, we shall find that some persons can take very heavy doses, whilst others are poisonously affected with unexpected rapidity. We must specially remember that children always bear opium badly, one drop of laudanum having proved fatal to an infant, that anæmic persons also are said by Traube to be readily susceptible. To guard ourselves as far as possible from risk, we shall do well to begin with a moderate dose, and invariably to ask our patient whether he has ever taken it before.

As the system seems rapidly to accustom itself to the use of opium, we require gradually to increase the dose, and so completely do persons habituate themselves to the pleasurable sensations derived, that they willingly brave the resulting languor and digestive disturbance, and take it in enormous quantities. De Quincey used to take as much as 320 grains daily, and from half a pint to a pint of laudanum is by no means an uncommon daily allowance. Although the Turks and Chinese are the principal victims of this habit, much opium is also consumed in this way in some parts of England, and moderate opium-eaters abound in all ranks of society. We must therefore be very careful to warn our patients from time to time of the absorbing nature of this practice, and of its enervating effects on mind and body; and although it seems evident that [continued] good health is altogether incompatible with [even] moderate opium-eating, and that its use by smoking is far more deleterious, still there is abundant evidence of the generally lowering tendency of the habitual use of this drug as an act of mere self-indulgence.

As regards the various pharmaceutical preparations of

opium, when we wish to produce sleep we generally prescribe the tincture in a medium dose, the pil. saponis co., or the extract; whereas, if we merely wish to relieve pain, smaller doses may prove sufficient.

The astringent action is best secured by small doses, which bring the stimulant properties of the drug into play; and an incipient coryza may often be checked by 5 or 10 minims of laudanum, taken at bed-time.

For diaphoretic purposes the combination with ipecacuanha, as in Dover's powder (*pulvis ipecacuanhæ compositus*), is of service; and, for the relief of diarrhœa, we also call to our aid the astringent properties of chalk and kino, as in the *pulvis cretæ aromaticus cum opio* [Br.], and the *pulvis kino compositus* [Br.]; or the *enema opii* [Br.] may be soothing both in this condition and as allaying, by nervous sympathy, various painful conditions of the uterus and bladder.

As an adjunct to cough mixtures, and as forming their really effective ingredient, we most conveniently prescribe opium under the form of either the *tinctura camphoræ composita* or of the *tinctura opii ammoniata* [Br.], as in Prof. Christison's well-known formula:—

R. Syrupi scillæ	fʒij.;
Aq. menth. pip.	fʒij.;
Tinct. opii ammoniatæ [Br.]	fʒss.;
Tinct. [spiritus] lavandulæ comp.	fʒss.;
Syrupi	fʒj. M.
Dose, fʒss. ter die.	

In diabetes we must push the [crude] drug boldly, to the extent even of from 6 to 8 grains a day.

The many-sided actions of opium, which we have just described, are due to its complex constitution and to the large number of alkaloids which it contains. Of these, morphia is by far the most generally used, and in the form either of hydrochlorate [muriate, the sulphate], or the acetate, but more especially of the former, it has in very considerable measure superseded the crude drug, on which we were formerly obliged to depend. Its principal differences from opium are as follows:—

It is less astringent and antiphlogistic, and, by interfering less with secretion, its use is not attended by so much headache, constipation, and dryness of tongue. It is more directly narcotic and anodyne, and is therefore

a more convenient remedy when we wish merely to promote sleep or relieve pain.

Its bulk is smaller than that of opium, and it is devoid of smell.

The action of the heart becomes slower, and the arterial tension is raised.

The respiration may become irregular from a depressing action on the vagi.

The functions of the spinal cord are stimulated, and hence we occasionally meet with restlessness and muscular twitchings, which in some of the lower animals run on into true convulsions.

Irritability of the bladder is often observed, and troublesome itching of the skin, depending, in some cases, on the development of a minute papular or vesicular eruption. Some years ago a favorite mode of using morphia was by what is known as the *endermic* method, in which the powder was sprinkled over the raw surface of a blister; but this has now been almost entirely superseded by the hypodermic syringe. This ingenious little instrument enables us to inject a small quantity of morphia in solution beneath the skin, and the relief to suffering is usually immediate, and sometimes permanent. It matters little whether we introduce the remedy into the immediate neighborhood of the painful spot, our only caution being to avoid the vicinity of large blood-vessels or nerves, and to plunge the nozzle [needle] of the syringe fairly through the skin into the adjacent cellular substance. Some smarting usually follows the entrance of the fluid, and inflammation and abscess may occasionally be produced; but these accidents are rare, and the sting of the primary puncture may readily be obviated by freezing the skin with ether-spray. These injections are now very largely practised for the relief of pain, and more especially in *facial neuralgia*, *sciatica*, *lumbago*, in the passage of *biliary* or *renal calculi*, in *cancer*, and in a vast range of diseases where acute suffering is the main symptom, we are enabled to give our patients temporary, and sometimes permanent, relief. So great, indeed, is the popularity of this mode of treatment, that a new school of opium-eating, so to speak, has been formed, and morphia-injections have unfortunately been practised to a great extent as a mere development of self-indulgence. We must, of course, be

very careful not to give even the most casual or indirect encouragement to such disastrous habits.

Some caution is always requisite in prescribing these injections for the first time, as not only severe sickness and vomiting have followed their use in many cases, but great prostration, with failure of the heart's action, and even death. We must therefore carefully watch our patient for some time after the completion of the little operation. We must never begin with a larger quantity than the sixth of a grain; and we are told, on good authority, that the combination of $\frac{1}{30}$ of atropia to one part of morphia will effectually obviate all risk of these unpleasant consequences. For injection we may use either the injectio morphiæ hypodermica [Br.], containing 1 gr. of the acetate in every 12 minims, or the elegant and convenient gelatine disks prepared by Messrs. Savory and Moore at the suggestion of Dr. Sansom, remembering that morphia acts in this way three times more powerfully than when taken by the mouth. For internal use we may prescribe either salt, remembering, however, the varying susceptibilities of different persons, and the fact that so small a quantity as half a grain has caused death; or we shall find the liquor morphiæ hydrochloratis [Br.] or acetatis [Br.], containing half a grain to the drachm, a convenient preparation.

Most of the other alkaloids contained in opium are merely subjects for physiological curiosity.

1. CODEIA, however, is now frequently used, not for its narcotic properties, which are feeble and transient, but for an undoubted soothing influence which it exerts over various painful affections of the kidney. It is also an established remedy in cases of diabetes, checking the secretion of sugar, and arresting, in some measure, the progress of the disease. Dose 1 to 3 grs.

2. NARCEIA possesses only one-eighth of the narcotic properties of morphia, and is never used in medicine.

3. CRYPTOPIA is one-fourth as powerful as morphia, and in addition to its hypnotic properties it causes in the lower animals peculiar illusions of vision, with a tendency to convulsive action. It also is never used.

4. [PARAMORPHIA OR] THEBAIA is purely excitant, and in doses of 1 grain it causes tetanic spasms.

5. NARCOTINA has no narcotic properties, but has some power as an antiperiodic.

6. PAPAVERINE is narcotic.

7. MECONINE is feebly narcotic.

8. APOMORPHIA is a powerful emetic, generally used by subcutaneous injection, in doses of $\frac{1}{16}$ gr.

[ORIGANUM—COMMON MARJORAM.

The herb of Origanum vulgare, U. S.

OFFICINAL PREPARATION.

Oleum Origani. Dose, gtt. ij.—v.

The oil of origanum is rarely used, being largely superseded in commerce by the oil of thyme. It is an aromatic stimulant. Origanum in infusion has been used as a diaphoretic and emmenagogue, and externally as a fomentation.]

[OS—BONE.

Introduced as the source of Calcii Phosphas Præcipitata and Sodii Phosphas.]

OVUM—EGG.

[*The egg of Phasianus Gallus, U. S.*

Used in pharmacy in making emulsions, and is an ingredient in Mistura Chloroformi.]

White of egg is of use as an antidote to various corrosive poisons, as perchloride of mercury, and the yolk (vitellus) has nutritive properties.

[PAPAYER—POPPY CAPSULES.

The nearly ripe capsules of Papaver somniferum, U. S.

Occasionally, though rarely, employed in decoction or cataplasm; and the Syrupus Papaveris (Br.) is sometimes given to children, but is an uncertain preparation.]

PAREIRA—PAREIRA BRAVA.

[*The root of Cissampelos Pareira, U. S.*

OFFICINAL PREPARATIONS.

Extractum Pareiræ Fluidum. Dose, fʒss.—j.

Infusum Pareiræ. Dose, fʒj.—ij.]

LOCAL ACTION.

Pareira has no local action.

CONSTITUTIONAL ACTIONS.

Physiological.

Digestive and Secreting Organs.—Pareira acts in some measure as a diuretic, but its main influence is directed to the bladder, which it appears to stimulate and strengthen, improving the tone of its mucous lining, and lessening abnormal secretions.

Therapeutical.

Pareira is used in various *chronic bladder-affections*, but it seems to be very uncertain in its action.

[PEPO—PUMPKIN SEEDS.

The seeds of Cucurbita Pepo, U. S.

Pumpkin-seeds are an efficient tænicide in doses of one or two ounces. The decorticated seeds, beaten into a paste with sugar or milk, are given in the morning fasting, followed, in an hour or two, by a dose of castor oil.]

PHOSPHORUS—PHOSPHORUS.

Dose, in substance, gr. $\frac{1}{60}$ to $\frac{1}{12}$.

ANTIDOTES.

There is no direct antidote, but turpentine is said to act as a prophylactic. [Old oil of turpentine is considered an antidote to phosphorus, followed by demulcents and evacuants.]

(Phosphorus is not used externally.)

Physiological Action.

1. Its action on the *nervous system* is tonic and stimulant, repairing the waste of tissue.

Therapeutical Action.

1. Phosphorus is therefore a valuable agent in *nervous debility*, where the brain is weakened by anxiety, worry, overwork, or sexual excesses, and where too great amount of phosphates is excreted by the urine; and

still more markedly in neuralgia, which has been shown by Anstie to depend on a feeble state of nerve tissue. It is also useful, like arsenic, in certain obstinate forms of skin disease, as *psoriasis*, &c.

Hammond has advised its use in the early stages of *brain-softening* from over-exertion.

2. On the circulation it acts in the first place as a stimulant; the pulse rises and gains in fulness but not firmness, the face flushes, and eventually signs of peripheral capillary expansion ensue, ending in free perspiration. In large doses, however, it depresses to a dangerous degree the heart's action.

3. The temperature during the administration of phosphorus at first rises slightly, next becomes secondarily lowered by three or four degrees in consequence of the dilatation of the superficial capillaries and resulting evaporation from the skin.

4. On the urine phosphorus exerts the following influence: Its quantity is increased, it becomes reddish, clouded with lithates, acquiring a violet smell, and, according to B. von Bauer, its proportion of urea is markedly increased.

2. Phosphorus may be given with decided benefit as a stimulant in *typhoid conditions* where great feebleness exists, and as a general tonic it is of marked value, the appetite being sharpened and a general sensation of well-being felt.

Hæmaturia results from a poisonous dose.

5. On the intestinal secretion no effect is produced by small doses; but, in the event of a large quantity being taken, great and persistent irritation of the stomach and intestines results, causing pain, vomiting, and purging. Jaundice is also a symptom of its poisonous action, and after death fatty degeneration of the liver is generally found.

6. To the skin, phosphorus acts in some measure as an irritant.

7. Its effects on the osseous tissue are remarkable, as it has the property of causing necrosis of the jaw-bone, and this used to be common in lucifer-match makers. Some interesting experiments by Wegner have recently shown a marked influence of phosphorus in promoting the formation of bone; for when given to growing animals the cancellous tissue was rapidly transformed into hard bone, and, even in the case of those fully developed, the medullary canal was

5. Much discussion has recently arisen respecting the remedial powers of phosphorus in *leucocythæmia* and *pernicious anæmia*, but the evidence is too conflicting to enable us to come to any decided opinion at present. The remedy is well worth trying, however, in these otherwise desperate cases, and Broadbent has recorded one remarkable success.

6. On this account, and also because of its stimulating the cutaneous circulation, phosphorus has been given with success in the eruptive fevers, such as *scarlet fever*, *measles*, &c., to develop an insufficiently developed, or prematurely faded, eruption.

7. The experiments of Wegner would indicate its use in *rickets*.

sensibly diminished by its use. Also, in cases of artificial fracture, not only was the resulting repair more rapid, but the quantity of bone thrown out was far in excess of the usual amount.

POISONOUS EFFECTS.

These we have seen to consist of intestinal irritation, cardiac syncope, and death from exhaustion, the *post-mortem* disclosing fatty and parenchymatous degeneration of liver, muscles, and tissues generally. $1\frac{1}{2}$ gr. has proved fatal.

Phosphorus is given out from the system principally by the urine, the drug being oxidised in the system and eliminated as phosphates.

CONTRA-INDICATIONS AND DISADVANTAGES.

We must generally feel our way in prescribing phosphorus, and begin with small doses, for some persons are more susceptible than others to its over-action, and Anstie records a case in which three or four $\frac{1}{3}$ gr. doses gave rise to long-continued epigastric pain. Nor must we forget its tendency to cause fatty degeneration of internal organs.

MODE OF ADMINISTRATION AND DOSE.

Much of our success, however, in giving phosphorus depends on the mode in which it is prescribed, and, as a general rule, capsules containing $\frac{1}{30}$ grain are found to be a convenient medium. It also goes well with cod-liver oil, but it is very difficult indeed to devise any liquid formula by which it is prevented from becoming rapidly inert by oxidation. Most of the pill-masses are useless from being made with insoluble materials which pass through the bowels unchanged.

The dose, speaking generally, is from $\frac{1}{60}$ to $\frac{1}{30}$ grain; or we may give the phosphide of zinc, a very convenient and reliable preparation, much praised by Ashburton Thompson, [in pills containing] from $\frac{1}{12}$ to $\frac{1}{4}$ grain.

ACIDUM PHOSPHORICUM GLACIALE—
GLACIAL PHOSPHORIC ACID.

[OFFICINAL PREPARATION, U. S.]

Acidum Phosphoricum Dilutum. Dose, $\text{m}x\text{--xl}$.]

This acid was formerly held to be of advantage in *diabetes*, but more recent investigation has shown that instead of diminishing it actually tends to increase the amount of sugar given off by the urine. It therefore cannot be held to have any special significance from a therapeutic point of view, but may be adopted as an agreeable mode of introducing acid into the system, as its flavor is agreeable. We may take occasion, however, to mention a mistake which is not uncommonly made in prescribing, and that is to prescribe phosphoric acid with the view of obtaining the medical influence of phosphorus. Now it is well known that only from phosphorus in a free condition do we obtain any real benefit, and of this phosphoric acid contains no trace.

[It has, however, been used as a tonic and alterative in *rickets* and *scrofula*; and is an excellent adjuvant to cough-mixtures, or tonics, for elderly patients.]

PHYSOSTIGMA—CALABAR BEAN.

[*The seed of Physostigma venenosum (Balfour), U. S.*]

The ordeal bean of Old Calabar.

[OFFICINAL PREPARATION.]

Extractum Physostigmatis. Dose, gr. $\frac{1}{8}$ — $\frac{1}{3}$.]

ANTIDOTES.

In addition to the general principles of treating this form of poisonous action, we have here physiological remedies at command—(1) atropia, which directly antagonises the respiratory depression; and possibly (2) strychnia, which stimulates the cord.

LOCAL ACTIONS.

Physiological.

Therapeutical.

When applied to the surface of the body, Calabar bean is therefore of use in ophthalmic surgery,

bean exerts no special influence, but when introduced to the eye it causes very complete contraction of the pupil.

to counteract the dilating effect of belladonna, and to prevent prolapse of the iris in cases of corneal injury or ulceration.

CONSTITUTIONAL ACTIONS.

I. *On Nervous System.*—

1. The brain is quite unaffected, the mind, in cases of poisoning, remaining clear almost to the last.

2. The spinal cord, however, is specially attacked, and to a diminution of its motor power are due the muscular enfeeblement and final paralysis which affect those brought fully under the influence of this drug. A still more remarkable result, however, is the total abolition of all reflex activity, the most energetic stimulation failing to elicit the slightest response.

2. The depressing action of Calabar bean on the reflex powers of the spinal cord led Fraser to propose it as a remedy for *tetanus*, and this mode of treatment has proved very satisfactory in alleviating the symptoms and checking the course of this terrible disease. It is of great importance that the drug should be early used and vigorously pushed, as there is every reason to believe that the cord is free from marked pathological changes during the first period of the disease.

Calabar bean has been tried without success in *chorea*, *epilepsy*, and other nervous disorders; but recently Dr. Crichton Browne has expressed his conviction, founded on the observation of a few cases, that it may prove useful in the general *paralysis of the insane*.

It has also been found to act as an effective antidote in *strychnia-poisoning*.

3. Although, in the first stage of Calabar-bean action, the motor nerves are unaffected, a secondary lessening of their conductivity is noted, and, with reference to the sympathetic system, an early excitation is followed by a secondary depression.

The contraction of the iris noted above, which takes place equally on local or internal administration, is considered due to paralysis of the peripheral vaso-motor nerve fibres, and to stimulation of the terminal filaments of the third nerve.

II. *Circulating Apparatus*.—Under small doses of Calabar bean, the heart's action becomes slower and stronger, and the arterial tension is notably increased; but when the system is brought more fully under the poisonous influence of the drug, the cardiac pulsations become feeble and irregular, and finally cease. These results are believed to be due to stimulation and subsequent exhaustion of the peripheral cardiac filaments of the vagi, and the primary contraction and subsequent relaxation of the arteries are explained in the same way.

III. *Respiration and Temperature*.—The breathing usually becomes slow and irregular, and the temperature falls a little.

IV. *Secreting Organs.*—Calabar bean tends to cause vomiting, with violent and painful contraction of the stomach and increased peristaltic movement of the intestines.

Increase in the salivary and cutaneous secretions has also been observed.

POISONOUS ACTION. CAUTIONS. MODE OF
ADMINISTRATION.

Calabar bean in small doses destroys life by paralysing the respiratory centre and causing suffocation, but in larger quantity it proves more speedily fatal by cardiac syncope.

Caution is of course necessary in dealing with so poisonous a substance as this. It is seldom used internally, for in tetanus the functions of the stomach are suspended in great measure, and drugs are probably only very partially absorbed. Subcutaneous injection is therefore our best method, and we use a solution of the extract (from $\frac{1}{4}$ to $\frac{1}{2}$ gr.), neutralising its irritating acidity by the addition of a little soda.

The alkaloid eserina [the active principle] is unstable and difficult to extract, and is therefore practically useless. [The sulphate of eserina is ten times the strength of the extract.]

[*Pilulæ.*

The officinal Pills are:—

<i>Pilulæ Aloës</i>	<i>Pilulæ Ferri Iodidi</i>
“ “ et <i>Assafoetidæ</i>	“ <i>Galbani Compositæ</i>
“ “ et <i>Mastiches</i>	“ <i>Hydrargyri</i>
“ “ et <i>Myrrhæ</i>	“ <i>Opii</i>
“ <i>Antimonii Compositæ</i>	“ <i>Quiniz Sulphatis</i>
“ <i>Assafoetidæ</i>	“ <i>Rhei</i>
“ <i>Catharticæ Compositæ</i>	“ “ <i>Compositæ</i>
“ <i>Copaibæ</i>	“ <i>Scillæ Compositæ.</i>
“ <i>Ferri Compositæ</i>	

Two Pill-masses are officinal: *Pilula Ferri Carbonatis* and *Pilula Saponis Composita.*]

[PIMENTA—PIMENTO (ALLSPICE).

The unripe berries of Eugenia Pimenta (De Candolle), U. S.

OFFICINAL PREPARATION.

Oleum Pimentæ. Dose, gtt. iij.—vj.

Pimento is a warm, aromatic stimulant, but is more used as a condiment than as a medicine. As a carminative, the dose is from ten to forty grains.]

PIPER—BLACK PEPPER.

[The unripe berries of Piper nigrum, U. S.]

OFFICINAL PREPARATION.

Oleo-resina Piperis. Dose, ℥j.]

Pepper is an acrid stimulant, acting more especially on mucous membranes, and hence, as a condiment, it is supposed to excite the secretion of the gastric juice. In former years it also acquired some reputation as a remedy for hæmorrhoids. [Piperin, not officinal, is sometimes added to antiperiodic pills, but probably owes its effects to an impurity, the active oil of pepper.]

PIX BURGUNDICA—BURGUNDY PITCH.

[A prepared resinous exudation from Abies excelsa (Lamarck's Ency. Method), U. S.]

Enters into Emplastrum Antimonii, Emp. Ferri, Emp. Galbani Compositum, Emp. Opii, Emp. Picis Burgundicæ, and Emp. Picis cum Cantharide.]

Pitch is used externally in the form of plaster.

[PIX CANADENSIS—CANADA PITCH (HEMLOCK).

The prepared resinous exudation from Abies Canadensis (Michaux, N. Am. Silva), U. S.]

OFFICINAL PREPARATION.

Emplastrum Picis Canadensis.

Used only in the form of the plaster. The oil of the Abies, or Pinus, Canadensis, or Hemlock Spruce (oil of spruce, oil of hemlock), has been given to produce abortion. A fluid extract of the bark (Ext. Pinus Canadensis fluid.), not officinal, is largely used as an astringent for gargles, vaginal douches, &c.]

PIX LIQUIDA—TAR.

[The impure turpentine from the wood of *Pinus palustris*, and of other species of *Pinus* prepared by burning, U. S.]

OFFICINAL PREPARATIONS, U. S.

Glyceritum Picis Liquidæ (℥xxx, in f℥j.). Dose, f℥j.—iv.

Infusum Picis Liquidæ (Tar 20 per cent.). Dose, f℥ss.—j.

Unguentum Picis Liquidæ (Tar, 50 per cent.).]

EXTERNAL ACTIONS.

Physiological.

Tar acts as a stimulant to the skin, and is apt to produce an irritable papular eruption. It is rapidly absorbed, and if allowed to remain in contact with the surface of the body, or if applied over an extensive cutaneous area, feverish symptoms ensue, with an abundant discharge of blackish urine, smelling strongly of tar.

Therapeutical.

Tar is an excellent application in cases of chronic scaly skin disease, as *psoriasis*.

To lessen the risk of exciting an undue amount of irritation, it is well to wash the skin perfectly clean before renewing the application, and it is important to rub in the ointment thoroughly until it nearly disappears.

INTERNAL ACTIONS.

Tar seems to have a stimulating action on mucous membranes when taken internally. [Tar contains a certain proportion of creasote, upon which some of its therapeutic effects depend.]

The vapor of tar used to be a remedy of some reputation in *chronic bronchitis*, and recently Prof. Ringer has recommended two-grain pills, three times a day, as a most efficient remedy in *winter-cough*. The internal use of tar has also been praised by Dr. McCall Anderson in chronic skin diseases. [The syrup of tar (℥j. in f℥iv.) is not officinal, but may be given in advanced *bronchitis*,

in half-ounce doses. The infusion is stimulant and diuretic.]

PLUMBUM—LEAD.

[OFFICIAL PREPARATIONS, U. S.]

Plumbi Oxidum (Litharge).

Emplastrum Plumbi (Lead-plaster).

Emp. Assafoetidæ (Assafoetida plaster).

Emp. Ferri.

Emp. Galbani Compositum.

Emp. Hydrargyri.

Emp. Opii.

Emp. Resinæ (Adhesive plaster).

Emp. Aconiti.

Emp. Arnicæ.

Emp. Belladonnæ.

Emp. Saponis.

Ceratum Saponis.

Liquor Plumbi Subacetatis (Goulard's extract).

Liq. Plumbi Subacetatis Dilutus (lead-water).

Ceratum Plumbi Subacetatis (Goulard's cerate).

Linimentum Plumbi Subacetatis.

Plumbi Acetas (Sugar of lead). Dose, gr. ij.-v.

Suppositoria Plumbi (each gr. iij.).

Suppositoria Plumbi et Opii (each gr. iij., and Ext. Opii gr. ss.).

Plumbi Carbonas.

Unguentum Plumbi Carbonatis (3j. in 3j.).

Plumbi Nitras (used as a disinfectant—Ledoyen's solution).

Plumbi Iodidum.

Unguentum Plumbi Iodidi.

ANTIDOTES.

Sulphuric acid forms an insoluble compound with lead, and, therefore, the soluble sulphates (alum, Epsom salts) are chemical antidotes to lead-poisoning; they are often given combined with sulphate of morphia to relieve pain and relax spasm.]

In poisoning by lead, we must give sulphate of magnesia, iodide of potassium, sulphur baths, and remove its after-effects by galvanism of the paralysed muscles; but it is stated that sulphuric-acid lemonade, and a liberal indulgence in fatty articles of diet, may act in some degree as prophylactics.

LOCAL ACTIONS.

Physiological.

The external action of lead is partly sedative and partly astringent. [All the preparations of lead are used externally, but the acetate appears to be the only one adapted for internal use.]

Therapeutical.

Lead, in the form of sub-acetate, is much used as a lotion for *erysipelas*, *acute eczema*, and various ulcerative conditions.

It forms a good collyrium in the more superficial inflammations of the eye; but we must remember that its tendency to deposition may cause a permanent white patch in corneal ulcers.

The powder of nitrate of lead has been shown to be a good application in *onychia maligna*.

INTERNAL ACTIONS AND USES.

1. *Brain and Nervous System.*—When lead is given in poisonous doses, a curious train of nervous symptoms show themselves, beginning with violent neuralgic pains and giddiness, and running on into delirium, with epileptiform convulsions, and subsequent melancholia. Sclerosis of the areolar tissue, with diminution of the nervous elements, has been found in certain of the sympathetic ganglia, but

more especially the cœliac and cervical ganglia. Atrophy of the optic nerve is an occasional, though rare, complication of lead-poisoning.

2. *Heart and Circulation.*

During the action of lead, the heart becomes slow, and the pulse smaller and harder, indicating a condition of contraction and tension of the arterial system; and this is by some supposed to be due to a primary effect on the sympathetic, whilst others hold that lead has a direct influence over unstriped muscular fibre, and most powerfully over that which encircles the arteries. Lead tends to produce pallor by destroying the red blood-corpuscles.

3. *Intestinal Tract.*—A prominent symptom of chronic lead-poisoning is obstinate constipation, depending probably on contraction of the small intestine, and associated with violent colicky pain around the umbilicus. The appetite at the same time becomes bad, the tongue loaded, and nausea and even vomiting are observed. Gastro-enteritis is generally one of the symptoms of acute poisoning.

Urinary System.—Lead has the curious property of obstructing the elimination

2. This contractile influence of lead over the smaller vessels explains its action in *internal hæmorrhage*, as we know that *hæmoptysis*, more especially, may be very successfully treated by acetate of lead in doses of from $\frac{1}{2}$ gr. to 3 grs.

3. Acetate of lead is an excellent astringent in *diarrhœa*, more especially that of phthisis, and British [or *sporadic*] *cholera*.

Dr. Thorowgood has obtained good results from lead in obstinate *obstruction of the bowels*.

of uric acid from the blood through the kidneys, and may thus cause gout in painters and others who are exposed to the effects of the metal.

Muscular.—Lead causes violent pains in the muscles, with a peculiar form of paralysis affecting the extensors of the fore-arms, and causing the well known wrist-drop; and *post-mortem* we find fatty degeneration of the muscular structures.

The contracting power of lead over unstriated muscular fibre probably explains the tendency to abortion noted during its poisonous influence.

POISONOUS EFFECTS.

The first sign of chronic lead-poisoning is a bluish line running along the free margin of the gums composed of minute dots, and depending on the actual deposition of lead in the mucous membrane. To this succeed colic, wrist-drop, and the other symptoms mentioned above, the post-mortem disclosing chronic catarrh of the stomach and intestines, with the deposition of the metal in the bones, liver, kidney, brain, nervous and muscular tissues.

Chronic lead-poisoning has occasionally resulted from adulterated cider or from water, and indeed in a variety of ways, but it is most common in painters, who are brought much in contact with the carbonate in the practice of their business.

MODE OF ELIMINATION.

Lead is thrown out of the system by the urine, skin, bowels, and milk.

MODE OF ADMINISTRATION, &c.

If we wish to administer lead internally, we generally prescribe either the acetate or pil. plumbi cum opii [Br.] (1 gr. of opium in 8), dose, 4 to 8 grs.

Externally we find the liquor plumbi subacetatis dilutus the most convenient form.

PODOPHYLLUM—MAY-APPLE.

[The rhizome of *Podophyllum peltatum*, U. S.]

OFFICIAL PREPARATIONS, U. S.

Extractum Podophylli. Dose, gr. v.—xv.

Resina Podophylli (incorrectly called *podophyllin*).
Dose, gr. $\frac{1}{8}$ — $\frac{1}{4}$.]

LOCAL ACTION.

Podophyllin cannot penetrate the unbroken cuticle, but experiment has shown that it exerts its purgative influence when applied to a raw surface.

CONSTITUTIONAL ACTIONS.

Physiological.

The only marked physiological property of this drug is that of irritating the duodenum and causing a profuse flow of watery evacuations, largely mixed with bile. Some controversy has taken place as to whether podophyllin can be called a cholagogue in virtue of any direct stimulation of the secreting structures of the liver, experimental evidence seeming to show that it probably acted by contracting the gall-bladder, and thus favoring the expulsion of its contents, and by exciting the duodenum to sweep away the bile effused into it by the hepatic ducts.

Therapeutical.

Podophyllin is a valuable remedy in *jaundice* and in the various forms of *functional liver-affection*. It may be used in simple *chronic constipation*, in the constipation of children attended with the painful and difficult evacuation of hard, dry fæces, and in the opposite condition of *diarrhœa* with pale and frothy motions.

In sick headache it also acts well.

[Podophyllum is an efficient substitute for jalap, and may be used for all purposes for which the latter drug has been recommended.]

The more recent experiments of Rutherford and Vignal, however, have re-instated podophyllin in its old position as a true stimulant of the biliary secretion.

CAUTIONS AND MODE OF ADMINISTRATION.

We must remember that podophyllin is an uncertain drug, acting well in some cases, very slightly in others, whilst in a third class it causes much discomfort and griping. It is advisable, therefore, always to begin with small doses, as $\frac{1}{4}$ gr. or $\frac{1}{2}$ gr., and to prescribe it in the form of pill, combined with other ingredients which may restrain its irritating action. Thus:—

R. Resinæ podophylli	gr. ij. ;
Extracti belladonnæ	gr. iij. ;
Pil. colocynthidis compositæ	gr. xxxvj. M.

Fiant pilulæ duodecim, quarum capiat unam omni nocte.

Ringer recommends a very convenient way of prescribing podophyllin for children, by dissolving a grain in a drachm of rectified spirit, and giving 5 or 6 drops three or four times a day on a lump of sugar [or painted on a bun].

POTASSIUM—POTASSIUM.

[OFFICIAL PREPARATIONS, U. S.]

Potassa. Caustic Potassa.

Liquor Potassæ. Dose, \mathfrak{m} x.—xxx.

Potassa cum Calce (equal parts), used as a caustic.

Potassii Acetas. Dose, gr. xx.—3j.

Potassii Carbonas Impura (Pearlash).

Potassii Carbonas. Dose, gr. x.—xxx.

(Extractum Spigeliæ et Sennæ Fluidum, Mistura Ferri Composita, Potassii Bicarbonas, Potassii Sulphuretum, and in making Chloroformum Purificatum and Spiritus Ætheris Nitrosi.)

Potassii Carbonas Pura. Dose, gr. x.—xxx.

(Used in making the Bromide and Cyanide, and Mistura Potassii Citratis.)

Potassii Bicarbonas. Dose, gr. x.—3j.

(Liquor Magnesia Citratis, Liquor Potassæ, Liquor Potassii Arsenitis, Liquor Potassii Citratis, Mistura Potassii Citratis, Potassii Acetas, Potassii Carbonas Pura, Potassii Citras.)

Potassii Bichromas (as an alterative). Dose, gr. $\frac{1}{8}$.
(Used in preparing Sodii Valerianas.)

Potassii Bitartras (Cream of Tartar). Dose, \mathfrak{z} j.-iv.
Antimonii et Potassii Tartras, Ferri et Potassii Tartras,
Potassii et Sodii Tartras, Potassii Tartras, Pulvis Jalapæ Compositus.

Potassii Bromidum. Dose, gr. xx.- \mathfrak{z} j.

Potassii Chloras. Dose, gr. v.-xx.
Trochisci Potassii Chloratis.

Potassii Citras. Dose, gr. x.-xxx.
Liquor Potassii Citratis. Dose, f \mathfrak{z} ss.

Potassii Cyanidum. Dose, gr. $\frac{1}{8}$.

Potassii Ferrocyanidum. Dose, gr. x.-xv.
(Used in making Acidum Hydrocyanicum Dilutum,
Argenti Cyanidum, Ferri Ferrocyanidum, Hydrargyri
Cyanidum, Potassii Cyanidum.)

Potassii Hypophosphis. Dose, gr. x.-xxx.

Potassii Iodidum. Dose, gr. x.- \mathfrak{z} j.
(Ammonii Iodidum, Hydrargyri Iodidum Rubrum, Li-
quor Iodinii Compositus, Plumbi Iodidum, Tinctura
Iodinii Composita, Unguentum Iodinii, Unguentum
Iodinii Compositum, Unguentum Potassii Iodidi (\mathfrak{z} j.
to \mathfrak{z} j.).]

Potassii Nitras. Dose, gr. x.-xv.

Potassii Permanganas. Dose, gr. j.-v.
Liquor Potassii Permanganatis (gr. iv. to f \mathfrak{z} j.).

Potassii Sulphas. Dose, gr. xx.- \mathfrak{z} iv.
Pulvis Ipecacuanhæ Compositus. Dose, gr. x.

Potassii Sulphis. Dose, gr. xv.- \mathfrak{z} j.

Potassii Sulphuretum. Dose, gr. ij.-v.

Potassii et Sodii Tartras (Rochelle Salt). Dose, \mathfrak{z} ss.-j.

Potassii Tartras. Dose, \mathfrak{z} j.- \mathfrak{z} j.

ANTIDOTES.

Vinegar and lemon-juice.

LOCAL ACTIONS.

Physiological.

Caustic potash is a most powerful escharotic, withdrawing water from the tissues, and thus destroying them. It has, however, the disadvantage of being very deliquescent, and this tendency to spread, beyond the part we wish to attack, has led to its practical abandonment as a local application.

The permanganate of potash, or Condyl's fluid, oxidises and destroys many organic substances.

Therapeutical.

Caustic potash, either in sticks or combined with lime in the form of *potassæ cum calce*, was formerly used in the treatment of various forms of ulceration, and for the production of issues, which barbarous relics of antiquity are now fortunately discarded from practice. *Liquor potassæ* has been recommended to soften the great toe-nail and facilitate its removal when ingrowing; and the bicarbonate of potash forms a good lotion in *acute eczema*, and as an injection in *leucorrhœa*, and as an application to *rheumatic joints*.

It is therefore antiseptic, and a good application to unhealthy ulcerations.

INTERNAL ACTIONS AND USES.

Physiological.

1. *Brain and Nervous System.*—Potash salts, and more especially the nitrate, when given in large doses, exert a paralysing action on the spinal cord, producing great muscular weakness and final abolition of reflex sensibility.

2. *Heart and Circulation.*

Moderate doses of the nitrate raise the arterial tension and slow the heart's action,

Therapeutical.

and if the drug is further pushed, the pulsations become weaker, still slower, and finally irregular, before the total arrest of movement supervenes.

Potash salts cause the blood, and secondarily, the urine, to become alkaline, and any excess of uric acid may thus become neutralised.

3. *Intestinal Tract.*—Chlorate of potash moderates excessive action of the salivary glands, and assists the healing of ulceration about the gums, mouth, and throat. The salts of potash generally neutralise free acid in the stomach and intestines, and the nitrate in full doses may cause death by gastro-enteritis. Most of the potash salts are slightly purgative, but only the acid tartrate has any very decided action of this kind, causing as it does the abstraction of a large quantity of watery fluid, without, however, stimulat-

2. This has been supposed to explain the beneficial action of potash in *acute rheumatism*, which is held to depend on an excess of uric acid. Much controversy has taken place with reference to the alkaline treatment of this disease, but I am decidedly of opinion that if large doses of bicarbonate of potash do not shorten its duration, they relieve symptoms, and lessen the tendency to cardiac complications. Potash acts well also in *gout* and *chronic rheumatism* by forming a soluble salt with uric acid.

3. Chlorate of potash, in doses of from 5 to 20 grains, is an admirable remedy in [*true croup*] *mercurial salivation*, in various aphthous conditions, and in sore throat, whether produced by scarlet fever or ordinary tonsillar inflammation, and a wash or gargle may well be combined with its internal administration.

In doses of from 120 to 300 grains, cream of tartar is a good purgative, but is principally used in combination with jalap, which, by stimulating the muscular movements of the small in-

ing the peristaltic movement of the intestines. The sulphate is also aperient in its action.

4. *On Secreting Organs.*—It will be remembered that, in speaking of acids, we referred to a law which has been more especially developed by Ringer, and which explains their power of checking acid secretions. Alkalies have precisely the opposite effect, arresting the activity of glands furnishing alkaline fluids, whilst they directly stimulate those whose secretion partakes of the opposite character.

Kidneys.—Most of the salts of potash, but more especially the acetate, nitrate, citrate, and acid tartrate, are diuretic, and the acetate, bicarbonate, and citrate, being converted into carbonate, speedily render the urine alkaline. Elaborate experiments have been made on the more precise alterations effected in the urine by the salts of potash. Prof. Parkes tells us that liquor potassæ increases the destructive metamorphosis of the nitrogenous tissues, and their elimination as urea, as well as that of the sulphur in the form of sulphates. The acetate has been shown

testines, prevents the probable reabsorption of the watery fluid.

4. We can therefore readily explain, on physiological principles, why alkalies are so useful in hepatic congestion, why they may also stimulate the pancreatic secretion, and why their action is so beneficial in cases of dyspepsia depending on deficient supplies of gastric juice. On these principles, also, we may readily understand the very striking power possessed by a weak solution of potash in arresting the alkaline secretion so freely poured out by the skin in acute eczema.

Potash salts are therefore good diuretics in *heart disease, chronic kidney affections, and various dropsical accumulations*; and their action is much more marked under these conditions than when administered to healthy subjects, since we have seen that the acetate, which is perhaps the most active of the diuretic group, may even check the elimination of water from the kidneys during health. Dr. Roberts, of Manchester, has proposed to dissolve uric acid calculi by keeping the urine alkaline for months with citrate of potash.

to diminish the water, urea, and earthy salts; whereas the citrate, according to Dr. Nunneley, increases the water, but diminishes the urea and solids.

Potash may be used under other conditions. Thus in asthma the inhalation of the fumes from burnt blotting-paper soaked in a strong solution of nitrate of potash is often effectual, chlorate of potash is a useful ingredient in a cough linctus; the citrate is an agreeable febrifuge, and is valuable in many of the feverish and dyspeptic affections of children.

Scurvy is held by some to be dependent on a deficiency of potash salts in the blood.

POISONOUS ACTION.

Partly from depression of the heart and partly from inflammation of stomach and intestines.

MODE OF ELIMINATION.

The potash salts, having a high diffusive power, pass readily into the blood, and are given out by the urine, in which the nitrate, chlorate, and sulphate reappear unchanged.

R. Liquoris potassæ	f℥ij.;
Tincturæ calumbæ	f℥ij.;
Infusi calumbæ	f℥vj. M.
Fiat mist. f℥j. ter in die.	

Antacid mixture.

R. Potassii bicarbonatis	℥j.;
Potassii acetatis	gr. xv.;
Potassii nitratis	gr. x.;
Aquæ	f℥ij. M.
Fiat haustus quartis horis sumend.	

This constitutes the "full alkaline" treatment recommended by Dickinson for acute rheumatism, and may be prescribed in effervescence.

[R. Potassii chloratis	℥ij.;
Syrupi limonis	f℥j.;
Aquæ	f℥ij. M.

Dose, according to the age of the child: if under two years f℥j., from two to ten f℥ij., over ten f℥ss., given

every three hours, or every half hour in urgent cases. Recommended as almost specific in diphtheritic croup by Dr. T. M. Drysdale, of Philadelphia.¹

R. Potassii chloratis ʒi.;
Aque ʒvj. M.
S. ʒj. ter die.

In ulcerated mouth or gums, or mercurial salivation.

R. Potassii bicarbonatis ʒss.;
Aque Oj. M.

A good lotion in acute eczema.

R. Potassii acetatis ʒjss.;
Aceti scillæ ʒiv.;
Decocti scoparii [Br.] ad ʒvj. M.
Fiat mist. Dose, ʒj. quartis horis.

Diuretic mixture.

R. Spiritus ætheris nitrosi ʒij.;
Potassii nitratis gr. xx.;
Decocti scoparii [Br.] ʒiv. M.
Fiat mist. Dose, ʒj. ter die.

Diuretic.

R. Potassii [bi-]tartratis ʒij.;
Succi scoparii [Br.] ʒvj.;
Aque ʒvj. M.
Dose, ʒj. ter die.

Diuretic.

R. Potassii chloratis gr. xl.;
Glycerini ʒss.;
Morphiæ hydrochlorat. [muriat.] gr. jss.;
Syrupi ad ʒiv. M.
S. ʒj. prout res poscit.

Dr. Douglas Powell's linctus for the chronic throat irritation of consumptive patients.

[Potassii bichromas.

Bichromate of potassium, in powder or strong solution, is a good escharotic and antiseptic application to *warts*, and *venereal excrescences*. It has been used internally in *secondary syphilis*, as an alterative, given in pill-form, with some bitter extract. Occasionally it produces salivation. It acts as an emetic in doses of $\frac{3}{4}$ gr. In large doses it is an irritant, corrosive poison. Antidotes, soap, magnesia, and bicarbonate of sodium.]

¹ [Phila. Med. and Surg. Rep., March, 1877, vol. xxxvi. p. 238.]

Potassii Bromidum.

(Bromide of Potassium is not used externally.)

*Physiological Action.***1. On Nervous Function.**

Long continuance in the use of pot. bromid. tends to cause a sense of fatigue and general muscular prostration, with giddiness and staggering.

Brain.—The functions of the brain are lessened, and sleep results. [Observation has shown that the bromides actually reduce the amount of blood in the brain.]

Spinal Cord.—It has been proved by experiments on animals that the reflex irritability of the cord is lessened, as indicated by the anæsthetic effect which is produced on the palate.

It has also been observed that the power of voluntary movement persists after the abolition of reflex function, proving that the influence of the drug is exerted probably either upon the different nerves or upon those portions of the cord which transmit the impulse from these nerves to the cells presiding immediately over motion.

Sympathetic System.—Pot. bromid. is supposed to have a sedative influence over the sympathetic system of nerves; but on this point the evidence is very contradictory.

Therapeutical Action.

1. Pot. bromid. has gained great repute within the last few years in the treatment of a large series of convulsive and spasmodic affections, and most especially in *epilepsy*, it being now thoroughly established that if we get our case sufficiently early we may absolutely cure it, and even if it is too confirmed for this result we may keep it in check. The cases most under the influence of the drug are those known as the *haut mal*, where violent struggling is followed by comatose sleep; on the other hand, in the *petit mal*, where the attack is indicated merely by passing unconsciousness, or when the seizures occur principally at night, the remedy will frequently disappoint us.

Pot. bromid. is believed to act in epilepsy by relieving the spasmodic contraction of a vessel supplying a special vascular brain area which is thus deranged in function.

It is also of great benefit in the various convulsive seizures of children, in *laryngismus stridulus*, *night terrors*, and also in those spasmodic symptoms which depend on meningitis or organic brain disease.

It is of service in *incontinence of urine*, *pertussis*, *cramp* of lower limbs, *chorea*, in *delirium tremens*, and in many of those forms of mental depression, nervous headache, and vague sensations, indicating nervous disturbance, which are so distressing to some women about the change of life.

It is said to be a good remedy in *sea-sickness*, from the sedative effect on the centre concerned in the reflex act of vomiting.

2. *Effects on Circulation.*

—No special action on the heart has been observed save some slight lowering of its action. The smaller arteries have been said to be contracted, the pulse becoming smaller; and we may thus explain the hypnotic action of the drug, the brain being rendered anæmic as in physiological sleep.

3. Its influence on *digestion* is not marked; for although it sometimes seems to lessen the appetite, this is not a constant result.

4. The effects on the *urinary secretion* have not been thoroughly made out.

5. Bromide of potassium has an undoubted influence over the generative organs, lowering their excitability, and even in large doses suspending their action.

2. Bromide of potassium is an excellent narcotic, and causes refreshing sleep, more especially in cases of worry, mental anxiety, or overwork, a full dose being given at bedtime; and in *acute mania* its use in combination with chloral is highly praised by Clouston.

4. It has been much praised by Begbie in *diabetes*.

5. It is useful in *priapism*, and in those forms of *menorrhagia* which depend on ovarian irritability.

Potassium bromide is eliminated from the system by the urine, breath, sweat, and milk (a case being recorded in which the child of a suckling mother taking this salt became covered with acne).

DISADVANTAGES AND CONTRA-INDICATIONS.

We have already noted the peculiar nervous symptoms occasionally caused by pot. bromid.—giddiness, general muscular fatigue, even amounting to actual staggering in some cases. But in addition to this an unpleasant eruption of acne often breaks out on the face, and may arise from a very small dose. If, in spite of this, the remedy is persisted in, the whole body may eventually be covered with large and unsightly blotches.

DOSE AND MODE OF ADMINISTRATION.

The dose for epilepsy ranges from 10 to 60 grains, it being necessary to increase the quantity gradually, and continue its use for long periods, even years, occasionally leaving it off for a week or so, after which it seems to regain some of its lost effect.

Dose as a hypnotic gr. xx. ad xxx. In other cases about gr. xx. as an average. Children bear it well, and we may give a child 2 or 3 gr. with good effect. As its taste is rather nauseous, we must disguise it, thus :—

R. Potassii bromidi	gr. xxx.;
Syrupi aurantii	fʒj.;
Aquæ aurantii flori	ad fʒij.
Fiat haustus horû somni sumendus	

[Or give it simply dissolved in water.]

[Potassii Iodidum—Iodide of Potassium.]

CONSTITUTIONAL ACTION.

Physiological.

1. *On Brain and Nervous System.*—No special action on the nervous system has been observed, unless we hold that the uncomfortable sensations of misery and depression occasionally fol-

Therapeutical.

1. Iodide of potassium is of great service in many *brain-diseases*, and most especially those in connection with tertiary *syphilis*, where gummata, and other forms of tumor, cause those excruciat-

lowing its use may be thus explained.

2. The effects of iodine on the *circulation* have never been properly estimated, but some observers say that it tends to contract the vessels and cause increased rapidity of the heart's action. Potassic iodide has very swift diffusive power, entering the blood very rapidly, being given off within ten minutes after ingestion.

3. On *respiration* and *temperature* no effects have been noted.

4. Effects on *secretion*.

a. *Intestinal*.—Nothing special save occasional loss of appetite and disordered digestion.

β. *Urinary*.—Potassic iodide has some diuretic action, more especially in connection with other drugs.

γ. The salivary secretion is often markedly increased, true salivation being sometimes produced.

δ. It is also believed that the iodide of potassium has some special action on glandular tissues in general, increasing their absorptive powers, and even exciting them to absorb themselves; and

ing pains and varying nervous phenomena which have been so ably described by Drs. Broadbent and Buzard.

2. Potassic iodide has been used with great benefit by Dr. Balfour and others in *aortic aneurism*, several successful cases having been reported. It is difficult to explain the *rationale* of its action, but it is essential that large doses (twenty grains) [ter in die] be prescribed and continued regularly for a year or more.

β. Potassic iodide is occasionally used to heighten the diuretic action of other drugs.

δ. The iodide of potassium is often given to facilitate and hasten the absorption of inflammatory lymph in the later stages of pleurisy, pneumonia, pericarditis, &c.

in support of this last proposition it has been stated that, under its use, the mammæ and testicles have been observed to waste and disappear. This conclusion has probably been arrived at, however, by confusing the *post* with the *propter hoc*, and it is probable that the remedy does not so much actually stimulate the absorbents as reduce effused lymph to a condition more favorable for elimination.

5. It also has the power of removing various metallic substances from the tissues, —mercury and lead, for instance, being occasionally deposited in the form of an insoluble albuminate, and released from this condition by the action of the drug.

6. Finally, this salt has an irritating action on mucous membranes, causing redness, tingling, and free secretion, resembling much an ordinary catarrh, and also thinning and liquefying tenacious, pathological, mucoid secretions.

5. In [cases of] *chronic lead-poisoning*, so often met in house-painters, or [where we wish] to remove mercury from the system, we generally prescribe potassic iodide, and in the latter case we must not be surprised if our patient is suddenly seized with profuse salivation. This is explained by the released mercury finding its way back into the circulation, and exerting its usual influence on the salivary glands.

6. Potassic iodide is often prescribed in cases of *bronchitis* where the expectoration is thick, tenacious, and difficult of expulsion, and it here acts well by thinning the sputa.

7. There are other important uses of potassic iodide which cannot be arranged under the preceding categories, and which must therefore be called specific. These are its influence over syphilis, gout, chronic rheumatism, and simple periostitis.

7. In cases of *tertiary syphilis*, this salt often acts like a charm. In the primary and secondary forms, it is of little or no use, but when the deeper tissues begin to be affected, and when we meet with deep rupial or other ulcerations of the skin, ulcers in the throat, periostitis, and head symptoms, we may then prescribe iodine with the certain expectation of relief. In chronic gout it is also of service, and in chronic rheumatism, more especially in those cases where we meet with tenderness to pressure and nocturnal increase of pain. In simple periostitis of the head, sternum, or tibia, which often results from exposure to cold, iodide of potassium has an almost magical effect, and will often bring about a cure after two or three days' treatment.

Potassic iodide is eliminated from the body by the urine, saliva, tears, milk, &c. ; it can be detected in the urine in ten minutes after being swallowed, and it is rapidly given out, so that the whole may be recovered from the various secretions.

DISADVANTAGES AND CONTRA-INDICATIONS.

As regards its disadvantages and contra-indications, we must remember the possible occurrence of iodism, to which unpleasant symptom some persons are much more susceptible than others. These consist, in the first place, of irritation about the mucous membranes, running at the eyes and nose, sneezing, frontal headache, swelling of the eyes, and salivation ; an eruption not unlike nettle-rash is

sometimes observed ; occasionally acne may be the result, and Ringer has described a peculiar petechial eruption affecting the legs. Quite recently Mr. J. Hutchinson has expressed his belief that the formidable pustular eruption known as hydroa is really caused by iodide of potassium, but in my own experience and that of others who have freely prescribed the drug, these various uncomfortable effects are comparatively seldom observed, a curious point being that iodism seems to be much more readily excited by small than by large doses of the drug.

In some persons a good deal of depression and digestive derangement is caused.

ANTIDOTE [TO IODISM].

Some few years ago, Sir James Paget observed that the addition of spiritus ammoniæ aromat. to potassic iodide not only lessened the chances of iodism, but enabled us to limit ourselves to a smaller dose, and this has come very generally into use.

DOSE, AND MODE OF ADMINISTRATION.

[The iodide of potassium should be prescribed alone, or only in combination with other preparations of iodine, or with corrosive sublimate. See *note*, page 26.

This salt may be given simply dissolved in water, or its taste may be well disguised by administering it in combination with compound syrup of sarsaparilla, or compound infusion of gentian.]

Potassic iodide as an anti-syphilitic [may be given in doses of] from 3 to 30 grains, or even 60, according to the judgment of prescribers, it being necessary in obstinate cases to push the drug very freely.

[Dr. Taylor, at the meeting of the American Dermatological Association held recently (Sept. 4-6) at Niagara Falls, said that patients would tolerate an ounce and a half daily and grow fat on it, the only physiological result being increased urination. He mentioned a case of nodes, where fourteen drachms daily were administered ; nothing less would give the patient relief at night. He thought that in similar cases the addition of bromide of potassium, one drachm to seven of the iodide, would be of advantage.

He also remarked that he had observed pains in the joints occasionally, even when small doses of iodide were

being administered, which were considered as being due to the remedies employed. He offered a practical suggestion in reference to the prevention of these pains (which are diurnal and not nocturnal), which was that tincture of colchicum and tincture of hyoscyamus, combined with small doses of the iodide of potassium, would obviate them. Occasionally it is necessary to use camphorated oil, or some warming application externally. The joint trouble is sometimes poly-articular, sometimes mon-articular.]

Professor Syme, however, used to say that all good effects can be obtained by two or three grains, and in ordinary cases of syphilis or periostitis, rheumatism, &c., this will [in his opinion] be found a sufficient dose, copious dilution aiding its effects.

In aneurism we must give at least twenty grains, and in advanced syphilitic affections even larger doses are well borne.

- | | | |
|----|--------------------------------|---------------|
| R. | Potassii iodidi | gr. xl.; |
| | Spiritus ammonii aromatici | f℥ss.; |
| | Syrupi aurantii | f℥.; |
| | Lecocci sarsaparillæ compositi | ad f℥viij. M. |
| S. | Capiat unciam unam ter in die. | |

PRUNUM—PRUNES.

[*The dried fruit of Prunus domestica*, U. S.

Enters into Confectio Sennæ.] Prunes are slightly purgative.

[PRUNUS VIRGINIANA—WILD CHERRY.

The bark of Cerasus Serotina (De Candolle), U. S.

OFFICIAL PREPARATIONS, U. S.

Extractum Pruni Virginianæ Fluidum. Dose, f℥j.

Infusum Pruni Virginianæ. Dose, f℥ij.–ij.

Syrupus Pruni Virginianæ. Dose, f℥ss.

Wild-cherry bark is tonic and sedative, the preparations containing a small amount of hydrocyanic acid. The syrup, from its pleasant flavor, is much used as an ingredient in cough syrups for *phthisis* or *chronic bronchitis*.]

[**Pulveres.**

The official Powders are :—

Pulveres Effervescentes.—Soda or effervescing powders.

“ “ *Aperientes.*—Seidlitz powders.

Pulvis Aloes et Canellæ.—*Hiera Picra* (holy bitter).

“ *Aromaticus.*—Spice powder.

“ *Ipecacuanhæ Compositus.*—Dover's powder.

“ *Jalapæ Compositus.*—Jalap and cream of tartar.

“ *Rhei Compositus.*—Rhubarb, magnesia, and ginger.]

PUNICA GRANATUM—POMEGRANATE.

[**Granati Fructus Cortex.** *The rind of the fruit of Punica Granatum, U. S.*

Granati Radicis Cortex. *The bark of the root of Punica Granatum, U. S.]*

Physiological Action.

Pomegranate bark destroys a *tape-worm*, according to Küchenmeister, in three hours. [Contains gallo-tannic acid, and may be used in decoction (ʒij. to Oj.) as an astringent wash.]

Therapeutical.

It is much used as an *anthelmintic* in veterinary practice [and is sometimes given in infusion as a gargle, and as an injection in *gonorrhœa*].

QUASSIA—QUASSIA.

[*The wood of Simaruba excelsa, U. S.*

OFFICIAL PREPARATIONS, U. S.

Extractum Quassiæ. Dose, gr. j.—ijj.

Infusum Quassiæ (ʒij. to Oj.). Dose fʒj.—ij.

Tinctura Quassiæ (ʒj. to Oj.). Dose, gtt. xx.—fʒj.]

Physiological Actions.

The action of quassia is directed to the gastro-intestinal mucous membrane, and it is probable that its intensely bitter taste may stimulate the secretion of gastric juice, as it certainly increases the appetite.

Therapeutical Actions.

Quassia is much used as a tonic in *dyspepsia*, want of appetite, and general debility. Having no aromatic flavor, it is sometimes badly borne by weak stomachs, but, being very cheap, it is largely prescribed in dis-

pensary practice, more especially in combination with iron.

Quassia is destructive to It is therefore of service, many of the lower forms of given as an enema, for the animal life. destruction of *thread-worms*.

QUERCUS—OAK.

[**Quercus Alba.** *The inner bark of Quercus alba, U.S.*
Quercus Tinctoria. *The inner bark of Quercus tinctoria, U. S.*

OFFICIAL PREPARATION, U. S.

Decoctum Quercus Alba (3j. to Oj.). Dose, f3iv.]

Oak bark contains tannic and gallic acids, and is therefore of some value as a topical astringent in relaxed throat, leucorrhœa, &c.

[RESINA—RESIN.

The residue after the distillation of the volatile oil from the turpentine of Pinus palustris, and of other species of Pinus, U. S.

Enters into Ceratum Cantharidis, Ceratum Extracti Cantharidis, Ceratum Resinæ, Ceratum Sabinæ, Ceratum Resinæ Compositum, Emplastrum Hydrargyri, and Emplastrum Resinæ.

Has no therapeutic interest.]

[Resinæ.

The officinal Resins are :—

Resina Jalapæ	Resina Scammonii.]
“ Podophylli	

[Oleo-resinæ.

The officinal Oleo-resins are :—

Oleo-resina Capsici	Oleo-resina Lupulinæ
“ Cubebæ	“ Piperis
“ Filicis	“ Zingiberis.]

RHEUM—RHUBARB.

[The root of *Rheum palmatum*, and of other species of *Rheum*, from China, Chinese Tartary, and Thibet, U. S.]

OFFICINAL PREPARATIONS, U. S.

Extractum Rhei. Dose, gr. x.—xxx.

Extractum Rhei Fluidum. Dose, gtt. x.—xxv.

Infusum Rhei (℥iv. to Oj.). Dose, f℥ij.—iv.

Pilulæ Rhei (each, gr. iij.). Dose, 4 to 8 pills.

Pilulæ Rhei Compositæ (Rhei gr. ij., Aloes gr. iss.).
Dose, 2 to 4 pills.

Pulvis Rhei Compositus $\left\{ \begin{array}{l} \text{Rhubarb } \bar{\text{℥}}\text{iv.} \\ \text{Magnesia } \bar{\text{℥}}\text{xij.} \\ \text{Ginger } \bar{\text{℥}}\text{ij.} \end{array} \right\}$ Dose, $\bar{\text{℥}}\text{ss.}-\text{j.}$

Syrupus Rhei (℥iss. to Oj.). Dose, f℥ss.—j.

Syrupus Rhei Aromaticus (℥ij $\frac{1}{2}$ to Oj.). Dose, for infant, f℥j.

Tinctura Rhei (℥ iss. to Oj.). Dose, f℥ss.—j.

Tinctura Rhei et Sennæ (℥ $\frac{1}{3}$ to Oj.). Dose, f℥ss.—j.

Vinum Rhei (℥ij. to Oj.). Dose, f℥j.—iv.]

CONSTITUTIONAL ACTION.

Physiological.

Like castor oil, rhubarb combines some astringent properties with its undoubted cathartic effects; and whilst the first [mentioned] action is no doubt due to the tannin which it contains, investigators have not yet determined on what special ingredient its purgative powers depend.

When taken in considerable doses, it not only stimulates the peristaltic movements of the small intestine, and more especially the duodenum, but it moistens and softens the fæces, and increases most decidedly the secretion of bile.

Therapeutical.

The astringent action of rhubarb renders it most useful in those forms of *diarrhœa* depending on the presence of indigestible matters in the alimentary canal, and where removal of the exciting cause, followed by rest of the irritated intestine, is sufficient to effect a cure.

It is a good tonic in some cases of *dyspepsia*, and forms a good purgative for children, more especially when combined with magnesia, as in the well-known Gregory's Powder [Pulv. rhei comp.].

Prof. Rutherford's experiments on its cholagogue action would indicate its

employment in *jaundice* and deficient secretion of bile.

The chrysophanic acid, or yellow coloring matter of rhubarb, is readily absorbed, and rapidly given out by the intestines, milk, sweat, and urine, to which latter secretion it imparts a yellow tinge, turning red on the addition of an alkali.

DOSE, MODE OF ADMINISTRATION, &c.

The smell and flavor of rhubarb are excessively nauseous, and, although we cannot effectually disguise either, we may at least render the drug moderately palatable by the following formulæ:—

R. Infusi rhei	f℥ij.;
Potassii bicarb.	℥i.;
Tinct. cinnamomi	f℥ij.;
Syrupi simplicis	f℥vj. M.

Dose, f℥j. secundâ quâque horâ.

In the diarrhœa of children.

R. Pulveris rhei	gr. xxx.;
Sodii bicarbonatis	gr. xv.;
Spiritus myristicæ	
Syrupi zingiberis	f℥j.;
Aquæ menthæ piperitæ	ad f℥iss.

Misce, fiat haustus nocte sumendus.

Antacid and purgative.

ROSA—ROSE.

[*Rosa Centifolia.* *The petals of Rosa centifolia, U. S.*
Rosa Gallica. *The petals of Rosa Gallica, U. S.*
Oleum Rosæ. *The volatile oil obtained from the petals of Rosa centifolia, U. S.*

OFFICIAL PREPARATIONS, U. S.

Aqua Rosæ (*Rosa centifolia*). As a vehicle.
Confectio Rosæ. As a vehicle.
Infusum Rosæ Compositum (containing sulphuric acid). As a vehicle.
Mel Rosæ. As a vehicle.
Syrupus Rosæ Gallicæ. As a vehicle.
Unguentum Aquæ Rosæ (cold cream).

Also enters into Pilulæ Aloës et Mastiches, and Syrupus Sarsaparillæ Compositus.]

The various preparations of roses have little therapeutical significance. The cabbage-rose is used in the form of rose-water as an elegant vehicle; the red rose petals as confection constitute a convenient basis for a pill mass, whilst, combined with sulphuric acid in the acid infusion, they make an excellent gargle, either alone or with alum, whilst they may occasionally be of service in concealing the nauseous flavor of sulphate of magnesia.

Hips [dog-rose, *rosæ caninæ fructus*, Br.] are also slightly astringent.

ROSMARINUS—ROSEMARY.

[*The leaves of Rosmarinus officinalis*, U. S.

Oleum Rosmarini. Used in perfumery.

Is rarely used in this country except in perfume.]

Rosemary, lavender, and peppermint are agreeable carminatives, much used in combination with other stimulant drugs.

[RUBUS—BLACKBERRY.

The bark of the root of Rubus Canadensis and of Rubus villosus, U. S.

OFFICINAL PREPARATIONS, U. S.

Extractum Rubi Fluidum. Dose, fʒss.

Syrupus Rubi. Dose, fʒj.-ij.

Much prized as a tonic and astringent, and particularly adapted to the *diarrhœa* of relaxation. A decoction is also made in domestic practice (ʒj. to Oiss., boiled down to a pint), of which fʒj.-ij. may be given three or four times daily.]

[RUTA—RUE.

The leaves of Ruta Graveolens, U. S.

Oleum Rutæ. Dose, gtt. iij.-vj.

Rue is stimulant, and, in large doses, is an acro-narcotic poison. Moderate doses have some emmenagogue effects, and, in cases of poisoning, miscarriage generally occurs.]

SABADILLA—CEVADILLA.

[*The seed of Veratrum Sabadilla (Retzius), U. S.*

OFFICIAL PREPARATIONS.

Veratria. Not used internally.

Unguentum Veratriæ (gr. xx. to ʒj.).

ANTIDOTES.

Vegetable astringent infusions, containing tannic acid, should be freely administered, the stomach washed out, followed by stimulants and an opium suppository, or enema. Tincture of digitalis would seem to be a physiological antidote. Whiskey may be given hypodermically on the approach of collapse.]

EXTERNAL ACTIONS.

Physiological.

The application of veratria to the skin causes first pricking and tingling, followed by redness and acute darting pain. To this succeeds numbness, due, in all probability, to some local anæsthetic influence on the extremities of the sensory nerves.

The slightest contact of veratria with the nasal mucous membrane causes violent irritation and prolonged sneezing.

Therapeutical.

Veratria has been used with success as a local application in cases of *neuralgia* of the fifth nerve, but its irritating properties must always be a barrier to its extensive employment. [The officinal ointment generally requires dilution $\frac{1}{2}$ to $\frac{3}{4}$. When used, care should be taken not to rub the eyes with the greasy fingers, as violent irritation may result.]

INTERNAL ACTIONS.

Veratria is never used internally in this country.

Brain and Nervous System.—No action on the brain.

Spinal Cord.—A good deal of elaborate, but unfortunately contradictory, experimental evidence has been adduced by various observers with reference to the effects of veratria on voluntary movement. In the first place convulsions and even tetanic spasms may be produced by the administration of the drug, but these are speedily followed

by paralysis and complete muscular prostration; and the balance of testimony goes to show that this is due to a primary exciting and secondary paralysing action on the muscular structures themselves.

Heart and Circulation.—Veratria first increases the action of the heart by stimulating its motor ganglia, but secondary slowing and depression rapidly ensue from an exciting action on the vagi.

Respiration is at first quickened, but subsequently retarded by the lowering effect of the drug on the respiratory centre. The temperature of the body falls.

Digestive and Secreting Organs.—Veratria often causes troublesome vomiting and purging.

SABINA—SAVINE.

[*The tops of Juniperus Sabina*, U. S.

Dose, in substance, gr. v.—xv.

OFFICINAL PREPARATIONS, U. S.

Ceratum Sabinæ (fluid extract, f̄ij. ; resin. cerate, 3xij.).

Extractum Sabinæ Fluidum. Dose, gtt. v.—xv.

Oleum Sabinæ. Dose, gtt. ij.—v.]

LOCAL EFFECTS.

Savin used to be applied in the form of ointment to blistered surfaces, with the view of encouraging suppuration, but this barbarous process is now happily abandoned. [It is stimulant and rubefacient, and is sometimes applied to warts, ulcers, and diseases of the scalp.]

INTERNAL USES.

Physiological.

Savin is a gastro-intestinal irritant, causing in large doses vomiting and purging; and it has also a powerful stimulating influence on the uterus.

Therapeutical.

Savin is sometimes used with criminal intent to procure abortion, and death has occasionally resulted from its irritant action. It is rarely used in medicine, although some authorities express faith in its emmenagogue powers.

SACCHARUM—SUGAR.

[*The sugar of Saccharum officinarum, refined, U. S.*

SYRUPUS FUSCUS—MOLASSES.

The impure dark-colored syrup, obtained in making sugar from Saccharum officinarum, U. S.

OFFICIAL PREPARATIONS.

Sugar enters into Pilula Ferri Carbonatis, Pilulæ Ferri Iodidi, and the various syrups.]

Sugar is principally used in the form of syrup as a flavoring adjunct.

[Syrupi.

The official syrups are:—

Syrupus Acaciæ	Syrupus Pruni Virginianæ
“ Acidæ Citricæ	“ Rhei
“ Allii	“ “ Aromaticus
“ Amygdalæ	“ Rosæ Gallicæ
“ Aurantii Corticis	“ Rubi
“ “ Florum	“ Sarsaparillæ Comp.
“ Ferri Iodidi	“ Scillæ
“ Fuscus	“ “ Compositus
“ Ipecacuanhæ	“ Senegæ
“ Krameriæ	“ Tolutanus
“ Lactucarii	“ Zingiberis.]
“ Limonis	

SACCHARUM LACTIS—SUGAR OF MILK.

[*A crystalline substance obtained from whey, U. S.*]

Milk and sugar of milk have no special therapeutical properties [apart from their nourishing qualities].

[SAGO—SAGO.

The prepared fecula of the pith of Sagus Rumphii, and other species of Sagus, U. S.

Used as an article of diet for the sick, thoroughly boiled in water (tablespoonful to the pint) and flavored with sugar, lemon, spice, or wine, according to taste.]

[SALVIA—SAGE.

The leaves of Salvia officinalis, U. S.

OFFICIAL PREPARATION, U. S.

Infusum Salviæ (℞ss. to Oj.). Used as a gargle.

Sage is tonic, astringent, and aromatic. It has been used as a carminative in debility of the stomach with flatulence, and the infusion is a useful gargle, to which honey, alum, or vinegar may be added, but it strikes a black color with iron (tannic acid). A weak infusion is sometimes used as a drink in fevers to allay nausea.]

SAMBUCUS—ELDER.

[*The flowers of Sambucus Canadensis, U. S.*]

Only used in the form of the aquæ sambuci [Br.], which is a cooling and pleasant lotion.

SANGUINARIA—BLOODROOT.

[*The rhizome of Sanguinaria Canadensis, U. S.*

OFFICIAL PREPARATIONS, U. S.

Acetum Sanguinariæ (℞ij. to Oj.). Dose, ℥xv.—xxx.

Tinctura Sanguinariæ (℞ij. to Oj.). Dose, gtt. xx.—xl.]

This is a substance of energetic physiological properties, causing clonic convulsions of spinal origin, diminishing reflex action, weakening the force of the heart, and lessening arterial tension, lowering the temperature, dilating the pupil, and finally causing death by respiratory paralysis. It also possesses [violent] emetic properties, and stimulates hepatic secretion. It has been used more especially in America, and has been found useful in atonic dyspepsia and duodenal jaundice, in chronic catarrh, and some stages of bronchitis, and may be given in doses of 5 to 10 minims of the tincture three times a day. [The root has been used as an escharotic in epithelial cancer.]

[SANTALUM—RED SAUNDERS.

The wood of Pterocarpus santalinus, U. S.

Used only in pharmacy as a coloring agent, and enters into Spiritus Lavandulæ Compositus.]

SANTONICA—SANTONICA.

[*The unexpanded flowers of Artemisia Cina.* (*Willkomm Botanische Zeitung*, 1872, No. 9), U. S.]

OFFICINAL PREPARATIONS, U. S.

Santoninum. Dose, gr. ss.—iij.

Trochisci Santonini (each, gr. ss.).]

LOCAL ACTION.

Santonin has no local action.

INTERNAL ACTIONS.

*Physiological.**Therapeutical.*

I. Brain and Nervous System.—It is no doubt due to some influence on the brain that the peculiar derangement of vision [which is sometimes found] accompanying the use of santonin, depends; as no staining of the ocular media has been observed, and slight hyperæmia of the retina is the only apparent local effect. Some observers note the first stage to be an exaggerated appreciation of the violet rays of the spectrum, but the most evident alteration in sight consists in very distinct yellow vision, all white objects being seen in a more or less pronounced saffron tinge, which begins about half an hour after the drug is swallowed. Associated with this we find a diminished or even abolished appreciation of the violet rays of the spectrum. A good deal of lassitude and mental

I. Santonin has been recommended as a remedy for some affections of the optic nerve, but no trustworthy evidence has yet been adduced of its efficacy.

Santonin has not been used in any form of nerve disease, but it seems at least possible that it might prove of service in some forms of so-called color-blindness.

depression usually follows the use of this medicine, and it must be cautiously pushed, as large doses have occasionally proved fatal from tetanic spasms and coma.

II. *Respiration and Circulation.*—No special influence on these functions has been noted. [In poisoning there is accelerated and feeble pulse and rapid respiration.]

III. *Secreting Organs.*—Slight digestive disturbance is usually experienced, indicated by nausea, headache, and general *malaise*.

Urinary Organs.—Remarkable effects are here noted, consisting of a bright yellow coloration of the urine, beginning five minutes after a few grains have been swallowed, persisting for two or three days, and communicating a stain to linen, as in the case of jaundice. Should the urine happen to be alkaline, the color assumes a blood-red tinge, and the same change follows the addition of ammonia to the acid secretion. At the same time the flow of urine is increased, the patient experiences an irresistible desire to micturate, and in the case of children this may even give rise to complete temporary incontinence.

III. The real use of santonin in practice consists in its effect on the round worm, or *ascaris lumbricoides*, which it speedily destroys. It appears to have no influence over the tape-worm, and it is an open question with regard to its service in cases of *ascaris vermicularis*.

Santonin has been recommended as a remedy for *incontinence of urine*, and is said to succeed occasionally in cases of this troublesome affection after other remedies have failed.

MODE OF ELIMINATION.

Santonin is supposed to combine with the soda in the blood, and to be given out, in part at least, by the urine.

CAUTIONS. MODE OF ADMINISTRATION.

[Prof. Binz has related a case of santonin-poisoning in which, apparently, a small dose produced serious symptoms. Two lozenges, containing less than a grain, were followed, 10 hours afterwards, by a convulsive attack which recurred several times during the next few days. The child never had convulsions before. It would seem as if the troches must have contained more of the drug than was suspected.¹]

As already observed, serious symptoms have been observed to follow the use of santonin, and we shall do well to warn our patients of the urinary irritability which is invariably experienced in greater or less degree. Dr. Sieveking has also drawn attention to the occurrence of urticaria following the administration of santonin, and Drs. Dyce and Ogson have given a suggestive hint by pointing out that its long-continued use causes the development of cataract in young animals.

[When retained in the system santonin becomes converted into *xanthopsin*, which appears in the urine. Poisonous symptoms are produced by this new substance, and they may be prevented by combining the santonin with a purgative, and in practice it is found that they are never produced when the santonin is combined with calomel.]

Its taste is not unpleasant, but as it is insoluble in water it may be mixed with jam or treacle, or simply sprinkled on bread and butter.

SAPO—SOAP.

[*Soap made with soda and olive oil, U. S.*

OFFICIAL PREPARATIONS, U. S.

Ceratum Saponis.

Emplastrum Saponis.

Linimentum Saponis.

Pilulæ Saponis Compositæ.

Enters into Extractum Colocynthis Compositum, Pilulæ Aloes, Pil. Aloes et Assafœtidæ, Pil. Assafœtidæ, Pil. Opii, Pil. Rhei, Pil. Rhei Compositæ, and Pil. Scillæ Compositæ.]

¹ [Phil. Med. Times, Aug. 1877, p. 551.]

Soap is not applied to any therapeutical purpose, except the hard variety, which enters into the construction of some pill masses, and both the hard and soft aid in the construction of liniments and plasters.

[Soft, or potassa-soap, sometimes termed green soap, *sapo viridis*, has been recommended by Hebra in alcoholic solution, under the name of *spiritus saponatus kalinis* (2 pts. soap, 1 pt. alcohol), in the treatment of chronic eczema.]

SARSAPARILLA—SARSAPARILLA.

[*The root of Smilax officinalis* (Humboldt and Bonpland), and of other species of *Smilax*, U. S.]

OFFICINAL PREPARATIONS, U. S.

Decoctum Sarsaparillæ Compositum (sarsaparilla, sassafras, guaiac, mezereon, and liquorice). Dose, f ̄iv.

Extractum Sarsaparillæ Fluidum. Dose, f ̄ss.

Extractum Sarsaparillæ Compositum Fluidum. Dose, f ̄j.

Syrupus Sarsaparillæ Compositum (̄iv. to Oj.). Dose, f ̄ss.]

INTERNAL ACTIONS.

Physiological.

Sarsaparilla has been credited with diaphoretic, diuretic, and other powers; but none of these have stood the test of rigid investigation, and it is difficult to find any convenient heading under which to class this popular drug, unless we shelve the difficulty by calling it an "alterative."

Therapeutical.

Nor is it easier to give any decided opinion regarding its therapeutical merits; for whilst some surgeons, like the late Mr. Syme, hold it to be quite useless, others believe it to be of service in constitutional *syphilis*, *chronic skin disease*, &c. One point of difficulty in arriving at any decided conclusion is, that it is usually prescribed along with three other drugs in the compound decoction; but the late Mr. Gascoyne used to say that he had found great benefit in the treatment of the *tertiary*

forms of syphilis by giving full doses of the freshly made infusion.

SASSAFRAS—SASSAFRAS.

[*The bark of the root of Sassafras officinale, U. S.*

Sassafras Medulla. *The pith of the stems of Sassafras officinale, U. S.*

Oleum Sassafras. Dose, gr. ij.—x.

OFFICINAL PREPARATION, U. S.

Mucilago Sassafras Medullæ (3ij. to Oj.). As a collyrium.

Enters into Extractum Sarsaparillæ Compositum Fluidum, and Decoctum Sarsaparillæ Compositum.]

This plant seems only to have acquired any therapeutic importance by reason of its combination with other drugs in the decoctum sarsaparillæ comp.

SCAMMONIUM—SCAMMONY.

[*A resinous exudation from the root of Convolvulus Scammonia, U. S.*

Dose, in substance, gr. v.—xv.

OFFICINAL PREPARATIONS, U. S.

Resina Scammonii. Dose (given in milk), gr. iv.—viij.

Extractum Colocynthis Compositum. Dose, gr. v.—xxx.]

INTERNAL EFFECTS.

Physiological.

Scammony causes a good deal of irritation of the alimentary canal, and produces copious watery stools, often attended with griping. For its proper action, previous solution in the bile, and combination with its soda, are requisite.

Therapeutical.

Scammony is a purgative used in *cerebral* and *dropsical affections*; and, being comparatively tasteless, it is well adapted for children, forming a convenient purgative for the removal of *ascarides*.

SCILLA—SQUILL.

[*The bulb of Scilla maritima, U. S.*

Dose, in substance, gr. ij.

OFFICINAL PREPARATIONS, U. S.

Acetum Scillæ (℥ij. to Oj.). Dose, ℥x.-xx.**Syrupus Scillæ.** Dose, f℥ss.**Pilulæ Scillæ Compositæ** (squill gr. ss., ammoniac and ginger each gr. j.). Dose, 3 to 5 pills.**Syrupus Scillæ Compositus** (tartar emetic gr. i. in f℥j.). Dose, gtt. x.-f℥j.**Tinctura Scillæ** (℥ij. to Oj.). Dose, ℥x.-xx.**Extractum Scillæ Fluidum.** Dose, ℥ij.-iij.]

INTERNAL EFFECTS.

Physiological.

In large doses, squill may act as an emetic, and cause violent vomiting with purging.

It also stimulates the bronchial mucous membrane, and increases the urinary secretion.

Therapeutical.

Squill is never used as an emetic [except for children in the form of "Hive Syrup," *Syrupus Scillæ Compositus*, which has been recommended in *spasmodic croup*. To be repeated at short intervals, until vomiting occurs].

It is, however, a good expectorant, increasing the bronchial secretions, and is one of the most universal additions to prescriptions for the relief of various chronic lung affections, as *bronchitis*, and also in *whooping-cough*.

It is also a tolerably efficient diuretic, only to be used, however, when no irritation exists about the kidneys.

SCOPARIUS—BROOM.

[*The tops of Sarothamnus Scoparius (Wimmer), U. S.*]

LOCAL EFFECTS.

No local action has been described.

CONSTITUTIONAL ACTIONS.

Scoparius has some influence over the digestive and secreting organs, causing, in large doses, vomiting and purging, but in smaller increasing very considerably the urinary water. Two active principles have been extracted from the drug, regarding whose physiological actions some difference of opinion exists. Thus *scoparin* is believed by one class of observers to be the diuretic factor in broom-tops, whilst others assert that it has no such property. *Sparteïn* has also been very variously described, but the balance of testimony goes to show that it has very definite toxic powers, lowering the reflex action of the spinal cord, paralysing the motor nerves, suspending the electrical excitability of the vagus, and finally causing death by respiratory paralysis.

Scoparius is an excellent diuretic, and is largely used for the purpose of removing dropsical accumulations. If we can succeed in stimulating the kidneys effectually by a combination of this and other drugs, we may hope to hold in check and disperse the *anasarca* of cardiac and chronic kidney-disease, and to aid the removal of the watery fluid of *hydrothorax* and *ascites*.

DOSE AND MODE OF ADMINISTRATION.

Scoparius is seldom prescribed alone, but is most usually made the basis of diuretic mixtures, on the well-known principle of combination, which is here of essential service.

℞. Potassii acetatis	℥jss. ;
Aceti scillæ	℥iv. ;
Decocti scoparii [Br.]	ad ℥vj. M.
Fiat mistura. Capiat unciam unam quartis horis.	

R. Tincturæ digitalis	℥x.;
Spiritus ætheris nitrosi,	
Spiritus juniperi	āā f℥ss.;
Succi scoparii [Br.]	f℥j.;
Aquæ	ad f℥j. M.
S. Ter die sumend.	

SENEGA—SENEKA.

[The root of *Polygala Senega*, U. S.]

Dose, in substance, gr. xx.

OFFICIAL PREPARATIONS, U. S.

Decoctum Senegæ (℥j. to Oj.). Dose, f℥j.
 Extractum Senegæ (alcoholic). Dose, gr. j.-iij.
 Extractum Senegæ Fluidum. Dose, ℥x.-xxx.
 Syrupus Senegæ. Dose, f℥j.
 Syrupus Scillæ Compositus.]

LOCAL EFFECTS.

No external or local action has been described.

CONSTITUTIONAL ACTIONS.

Physiological.

The principal action of senega is that of stimulating the mucous membrane of the bronchial tubes, and possibly, by a tonic influence on their muscular tissues, facilitating the expulsion of their contents. It has also been accredited with diaphoretic, diuretic, and emmenagogue properties, but is seldom employed in any other capacity than as an expectorant.

Therapeutical.

Senega is of great service in the more chronic conditions of *pneumonia* and *bronchitis*, where it seems to help the patient to get rid of the large quantities of secretion frequently accumulated within the lungs. Theoretically at least, its stimulating properties would contra-indicate its use in the more acute pulmonary affections, but in the later stages of bronchitis, and more especially those cases occurring among the very old and young, it is of real value.

DOSE AND MODE OF ADMINISTRATION.

The infusion is the preparation most commonly em-

ployed, and it is generally combined with carbonate of ammonia and other expectorants. Thus:—

R. Ammonii carbonatis	gr. iv.;
Tincturæ scillæ	℥xv.;
Tinct. camphoræ comp. [Br.]	℥xxv.;
Extracti glycyrrhizæ	gr. v.;
Infusi senegæ [Br.]	ad f℥j. M.
Fiat haustus ter die sumendus.	

SENNÆ—SENNÆ.

[The leaflets of *Cassia acutifolia* (Delile), of *Cassia obovata* (De Candolle), and of *Cassia elongata* (Lemaire, *Journ. de Pharm.*, vii., 345), U. S.

OFFICIAL PREPARATIONS, U. S.

Confectio Sennæ. Dose, ℥j.—ij.

Extractum Sennæ Fluidum. Dose, f℥j.—iv.

Infusum Sennæ (℥j. to Oj.). Dose, f℥ij.—iv.

Tinctura Rhei et Sennæ. Dose, f℥ss.—ij.

And enters into Syrupus Sarsaparillæ Comp.]

INTERNAL EFFECTS.

Physiological.

Senna irritates the small intestine, causing copious, thin, yellow evacuations, and stimulating the peristaltic movements of the bowel.

Therapeutical.

Senna is a most useful purgative, ranking among the cathartics with slightly drastic tendencies, and it may be prescribed in simple constipation, in dyspepsia, and in a large variety of conditions where rapid and effectual unloading of the bowels is required.

DOSE AND MODE OF ADMINISTRATION.

Senna is seldom prescribed alone, as it is then apt to cause irregular contraction of the intestines and griping. It is therefore usually combined either with other purgatives, as mag. sulph. [black draught], or with various aromatics, as in the confection and compound mixture.

Cassia and tamarinds have both a slightly purgative action, but are only used as ingredients in various compound preparations, as the confection of senna.

SERPENTARIA—VIRGINIA SNAKEROOT.

[*The root of Aristolochia Serpentaria, of Aristolochia reticulata, and of other species of Aristolochia, U. S.*

OFFICIAL PREPARATIONS, U. S.

Extractum Serpentariæ Fluidum. Dose, gtt. xx.

Infusum Serpentariæ (℥ss. to Oj.). Dose, f℥j.—iv.

Tinctura Serpentariæ (℥ij. to Oj.). Dose, f℥j.—ij.]

This drug is probably a gentle tonic, but the other virtues with which it has been credited seem to rest on no very stable foundation. [It belongs to the class of the aromatic bitters, and is a good addition to other tonics, as in the popular Huxham's tincture—*Tinctura Cinchonæ Comp.*]

[SEVUM—SUET.

The prepared suet of Ovis Aries, U. S.

Used only in pharmacy, and as an ingredient in *Ceratum Resinæ Compositum*, *Unguentum Hydrargyri*, and *Ung. Picis Liquidæ*.]

SINAPIS—MUSTARD.

[**Sinapis Alba.** *The seed of Sinapis alba, U. S.*

Sinapis Nigra. *The seed of Sinapis nigra, U. S.*

OFFICIAL PREPARATION, U. S.

Charta Sinapis. Mustard papers, 4 inches square.]

LOCAL ACTIONS.

Physiological.

Mustard applied to the skin causes a vivid redness, with violent smarting and itching, and, if the application be continued too long, vesication may follow, and even troublesome ulceration.

Therapeutical.

Mustard is used, firstly, for the relief of pain, and there can be no doubt of the benefit thus derived in many nervous, rheumatic, and inflammatory affections. In *neuralgia, lumbago, sciatica, pleurodynia, pleurisy, pneumonia, peritonitis, colic*, and a vast variety of painful

disorders, we may expect to alleviate suffering in some measure by the use of sinapisms, and at other times we use this mode of drawing blood to the surface, and so relieving the congestion of deeper parts, on the principle referred to under the heading of "Counter-irritation."

Mustard poultices are most valuable in arousing patients from the dangerous comatose condition into which they occasionally drift in the course of some of the acute inflammations; and sinapisms applied to the feet and calves are of service in the stupor of *narcotic poisoning* and in *uræmic coma*.

Mustard baths may be employed to bring back the eruption of some abortive cases of the exanthemata, or as a stimulant in *acute bronchitis* or in the *convulsions of children*.

CONSTITUTIONAL ACTIONS.

Physiological.

Digestive Organs.—Mustard increases the appetite by irritating the mucous membrane of the stomach, but does not increase the secretion of gastric juice.

It acts as a prompt and effectual emetic of the direct class.

Therapeutical.

Mustard is extensively used as a dietetic condiment.

This emetic power is of great value in cases of poisoning, as mustard is always at hand, and can be used at once.

MODE OF ADMINISTRATION.

A mustard poultice must be made with cold water, for we know that hot water dissipates the volatile oil on which the counter-irritation depends, vinegar destroys it, and alcohol prevents its formation. It must be kept on from twenty minutes to half an hour, according to circumstances.

SODIUM—SODIUM.

[**Sodii Acetas.** Acetate of Sodium. Dose, gr. xx.— ʒij .

Sodii Bicarbonas Venalis. (In making Aqua Acidi Carbonici, and Sodii Bicarbonas.)

Sodii Boras (Borax). Dose, gr. x.—xl.

Mel Sodii Boratis (ʒj . to $f\text{ʒj}$.)

Glyceritum Sodii Boratis (ʒij . to $f\text{ʒj}$.)

Sodii Carbonas. (In making Aluminii Sulphas, Antimonii Oxysulphuretum, Bismuthi Subnitratis, Cadmii Sulphas, Bismuthi Subcarbonas, Calcii Carbonas Præcipitata, Ferri Subcarbonas, Liqueur Sodæ, Liqueur Sodæ Chlorinata, Pilula Ferri Carbonatis, Pilula Ferri Composita, Potassii et Sodii Tartras, Sodii Carbonas Exsiccata, Sodii Phosphis, and Zinci Carbonas Præcipitata.)

Sodii Chloridum (table-salt). (In making Calomel and Corrosive Sublimate.)

Sodii Hypophosphis. Dose, gr. x.—xxx.

Sodii Hyposulphis. Dose, gr. x.—xx.

Sodii Nitratis. (In making Sodii Arsenias.)

Sodii Sulphas (Glauber's Salt). Dose, ʒss .— j . (In making Sodii Carbonas.)

Sodii Sulphis. Dose, ʒj .

OFFICIAL PREPARATIONS, U. S.

Soda. Caustic Soda.

Liqueur Sodæ. Dose, well diluted, m v .—x.

Sodii Arsenias. Dose, gr. $\frac{1}{2}$ — $\frac{1}{3}$.

Liqueur Sodii Arseniatis. Dose, m iij .—v.

Sodii Bicarbonas. Dose, gr. x.—xx.

Pulveres Effervescentes. Soda powders.

Pulveres Effervescentes Aperientes. Seidlitz powders.

Trochisci Sodii Bicarbonatis.

Sodii Carbonas Exsiccata. (Used in making Sodii Arsenias.)

Sodii Phosphas. Dose, as a cholagogue, gr. xx.-xl. ; as a purgative, ʒj.-ij. (Used in making Ferri Phosphas and Ferri Pyrophosphas.)

Liquor Sodæ Chlorinatæ (Labarraque's Solution). Dose, fʒss.-ij., well diluted.]

EFFECTS AND USES.

The soda salts have none of the depressing action on the heart which we have seen to be possessed by potash.

Locally, we may use soda in *acute eczema*; or the hyposulphite in parasitic skin-disease, where it acts in virtue of the contained sulphurous acid; and the biborate, or borax, as a gargle, as a lotion in *pruritus* and various skin diseases, and as an application to ulcerations about the mouth.

Soda is not so much used internally as a remedy for gout and rheumatism, because the urate of soda is less soluble than the urate of potash; but it is one of our best remedies in those forms of *dyspepsia* with pain after food, weight at the stomach, red fissured tongue, cough, and palpitation. The hyposulphite is useful in *sarcinous vomiting*.

Chloride of sodium is a good emetic; the phosphate and tartrate are purgative, and none of the preparations appear to be decidedly diuretic in their action.

Seidlitz Powder. [Pulvis Effervescens Aperiens, U. S.]

R. Sodæ tart. [Br.] [Potassii et Sodii tart.]	ʒij. ;
Sodæ bicarbonatis	gr. xl.
Misce, ut fiat haustus effervescens cum Acidi tartarici	
gr. xxxv. et aquæ fʒiv. Statim sumendus.	
R. Sodii bicarbonatis	gr. xx. ;
Tinct. calumbæ	℥xx ;
Syrupi zingiberis	fʒss. ;
Infusi gentianæ compositi	ad fʒj.
Misce, ter die sumend.	

Useful draught in dyspepsia.

[The following is a pleasant antacid combination, known as—

Soda-Mint.

- R. Sodii bicarbonatis,
Sacchari āā ʒij;
Spiritus ammoniæ aromatici ℥xl;
Aquæ menthæ piperitæ q. s. ad f̄ viij. M.
- S. Dose, a tablespoonful after meals.

Used in flatulent dyspepsia. It admits the addition of tr. nux vomica or syrup of rhubarb.]

[SPIGELIA—PINKROOT.

The root of *Spigelia Marylandica*, U. S.

Dose, in substance, ʒj.

OFFICIAL PREPARATIONS, U. S.

Extractum Spigeliæ Fluidum. Dose, fʒj.-ij.

Extractum Spigeliæ et Sennæ Fluidum. Dose, f3ij.-iv.

Infusum Spigeliae (3ss. to Oj.). Dose, f3iv.-viiij.;
for a child, f3ij.-f3j.

Spigelia is an efficient remedy against the *round worms*, or lumbricoids, and, in moderate doses, is entirely safe; but in overdoses has narcotic properties. It is given in infusion or syrup, morning and evening, for two or three days, followed by a brisk cathartic.]

[SPIRITUS FRUMENTI—WHISKEY.

Spirit obtained from fermented grain by distillation, and containing from 48 to 56 per cent. by volume, of absolute alcohol, U. S.

SPIRITUS MYRCIÆ—BAY-RUM.

The spirit obtained by distilling rum with the leaves of *Myrcia acris*,
(Schwartz), U. S.

SPIRITUS VINI GALLICI—BRANDY.

The spirit obtained from fermented grapes by distillation, and containing from 48 to 56 per cent. by volume, of absolute alcohol, U. S.

For effects and uses, see ALCOHOL.]

[STATICE—MARSH-ROSEMARY.

The root of Statice Limonium, variety Caroliniana, U. S.

Statice is a powerful, indigenous astringent, and may be

used as a substitute for kino and catechu. It has been quite popular as an application to *ulceration of the throat*. In *scarlatina*, it is used both as an *internal* and local remedy. The infusion or decoction is generally employed.]

[STILLINGIA—STILLINGIA (QUEEN'S-ROOT).

The root of Stillingia sylvatica, U. S.

Dose, in substance, gr. xx.

OFFICINAL PREPARATION, U. S.

Extractum Stillingiæ Fluidum. Dose, ℥xx.-xl.

Stillingia is highly esteemed as an alterative in *secondary syphilis*, *skin-diseases*, and *scrofula*. In large doses it is emetic and cathartic. As an alterative, it is frequently given in combination with sarsaparilla. A decoction (℥j. to Oij. boiled to Oj.), dose, f℥j.-ij.; and a tincture (℥ij. to Oj.), dose f℥j., are largely used in the South, but are not officinal.]

STRAMONIUM—STRAMONIUM.

[**Stramonii Folium.** The leaves of *Datura stramonium*, U. S.

Stramonii Semen. The seed of *Datura stramonium*, U. S.

OFFICINAL PREPARATIONS, U. S.

Extractum Stramonii Foliorum. Dose, gr. $\frac{1}{4}$ - $\frac{1}{2}$.

Extractum Stramonii Seminis. Dose, gr. $\frac{1}{4}$ - $\frac{1}{2}$.

Tinctura Stramonii (seeds ℥ij. to Oj.). Dose, ℥x.-xx.

Unguentum Stramonii (extract ℥j. to ℥j.).

ANTIDOTES.

Same as for belladonna-poisoning.]

After the careful description already given of the actions and uses of belladonna, it is unnecessary to say much about stramonium. Modern investigation has shown that the active principle, *datura*, is identical with *atropia*; and the only marked difference between the two plants seems to consist in the more decided antispasmodic properties of

stramonium, which cause it to be much prized as a remedy for *asthma*. In the purely spasmodic varieties of that disease, and most efficiently when inhaled in the form of smoke, it seldom fails to give relief.

[STYRAX—STORAX.

A balsam prepared from the bark of Liquidambar orientale (Lamarck), U. S.

Storax has been recommended as a substitute for copaiba in the treatment of *gonorrhœa* and *gleet*; and mixed with olive oil, equal parts, is effectual in the treatment of *scabies*. It is ranked as a stimulating expectorant, but is chiefly used as an ingredient in the compound tincture of benzoin.]

SULPHUR—SULPHUR.

[Sulphur Lotum. Sublimed sulphur, thoroughly washed with water, U. S.

Sulphur Sublimatum. Sublimed sulphur, U. S.

OFFICINAL PREPARATIONS, U. S.

Sulphur Præcipitatum. Dose, ʒj.—iij.

Sulphuris Iodidum. Not used internally.

Unguentum Sulphuris (1 part sulphur, 2 parts lard).

Unguentum Sulphuris Iodidi (gr. xxx. to ʒj.).

Sublimed sulphur is used in making Emplastrum Ammoniaci cum Hydrargyro, Hydrargyri Sulphuretum Rubrum, Potassii Sulphuretum, Sulphur Præcipitatum, and Sulphuris Iodidum.]

EXTERNAL USE.

Sulphur is used externally as a stimulant in various forms of chronic skin-disease, such as *acne faciei*, and more especially in *itch*, a disease dependent on the presence of a minute insect, the *acarus scabiei*, the male of which ranges freely over the skin, whilst the female retires with her eggs to oblique burrows in the cuticle. These receptacles having been broken up by soap and water, sulphur ointment is carefully spread over all the patient's body at bed-time, and washed away by a warm bath next morning. Two or three applications of this sort

are sufficient to cure the disease, and if the patient's skin will bear the unguentum sulphuris, one smearing with this may be sufficient. The *rationale* of the treatment is, not that sulphur acts as a direct poison to the acarus, but that it forms with lard a very tenacious and adhesive substance which suffocates the insect by blocking up its air-pores. [The sulphur ointment should generally be diluted $\frac{1}{2}$ to $\frac{3}{4}$, as it is apt to produce too great irritation.]

Sulphur is also in great favor as a popular remedy for rheumatism, sprinkled on new flannel and applied to the painful part, and there is no doubt that some beneficial action may thus be caused. Lastly, sulphur makes a useful bath in some forms of chronic skin disease.

INTERNAL USE.

Physiological Action.

1. It has been supposed to exert a stimulating influence on the mucous membranes and skin.

2. It causes slight increase of the peristaltic movements of the bowels.

Therapeutical Action.

1. In virtue of this, it used to be occasionally prescribed in *chronic bronchitis* and *phthisis*, and also used externally in *skin-diseases*. To its action on the skin may be attributed its undoubted power of aiding, —more especially in the form of bath,—the elimination of lead and mercury from the system. Sulphur has lately been recommended as the best means of preventing mercurial salivation.

2. It acts, therefore, as a gentle laxative, slightly softening the fæces, and from the mildness of its action it is specially useful in *piles* and all irritable conditions about the rectum. Its purgative action is increased by its being dissolved and formed into a sulphide by the alkali of the bile.

3. Sulphur has well-marked antiseptic properties in consequence of its destructive power over the lower forms of vegetable life.

3. Burnt in a room with closed doors and windows, it is the best way to remove the germs of infection from the air by fumigation.

Sulphur is given off from the system principally by the bowels, but also by the milk, the sweat, and the skin, in the form of sulphuretted hydrogen, and by the urine as a sulphate.

Strong applications of sulphur frequently irritate the skin, and bring on troublesome eczema. The disadvantage of sulphur as an aperient is the offensive odor which the sulphuretted hydrogen communicates to the fæces.

The confection [Br.] is the best purgative form [containing sulphur ℥iv. , and cream of tartar ℥j. , in syrup of orange-peel f℥iv.], in tea- or tablespoonful doses, and for external use the ointment is generally prescribed.

ACIDUM SULPHUROSUM—SULPHUROUS ACID.

[*An aqueous solution of sulphurous acid gas, having the odor of burning sulphur, and a sulphurous, sour, and somewhat astringent taste. Its specific gravity is about 1.035.*]

Dose, f℥ss. ad f℥j. [Largely diluted with water.]

EXTERNAL USE.

The therapeutic properties of this acid depend in part on its very poisonous influence on the lowest forms of animal and vegetable life. Thus it forms a good application to those varieties of skin disease, as *tinea tonsurans*, *chloasma*, &c., which depend on the presence of a minute cryptogamic plant; and Dr. Dewar some years ago published a pamphlet in which he ascribed to this acid powers little short of marvellous. Going on the theory that a very great number of diseased conditions depend on the irritation of germs, Dr. Dewar most confidently advised its use in affections ranging from rheumatic fever to chilblains. Although experience has naturally not borne out his extravagant assertions, we have to thank him for making known to us the undoubtedly good effect of sulphurous acid in various forms of sore throat, used in considerable dilution either as spray or gargle. It is also a good dis-

infectant, as we know that the antiseptic properties of sulphur, when burnt for purifying purposes, depend on its formation.

INTERNAL USE.

Sulphurous acid has been recommended by Dr. Lawson in *pyrosis*, the dyspeptic symptoms attending which are due to various forms of lepto-thrix and vegetable growths burrowing in the mucous membrane of the stomach; and in *flatulence* it is also deserving of a trial.

ACIDUM SULPHURICUM—SULPHURIC ACID.

[*Sulphuric acid of the specific gravity 1.843, U. S.*

OFFICIAL PREPARATIONS, U. S.

Acidum Sulphuricum Aromaticum. Dose, ℥v.—xx.

Acidum Sulphuricum Dilutum (fʒij. to Oj.) Dose, ℥v.—xx.

Also enters into the manufacture of Acidum Sulphurosum, Aluminii Sulphas, Atropiæ Sulphas, Cadmii Sulphas, Ferri Sulphas, Hydrargyri Sulphas Flava, Liquor Ferri Subsulphatis, Liquor Ferri Tersulphatis, Oleum Æthereum, Quiniæ Sulphas, Acidum Hydrocyanicum Dilutum, Æther, Argenti Cyanidum, Chloroformum Purificatum, Hydrargyri Chloridum Corrosivum, Hydrargyri Chloridum Mite, Hydrargyri Cyanidum, Pyroxylon, Sodii Phosphas, Spiritus Ætheris Nitrosi, and Veratria.

ANTIDOTES.

Alkalies, which should be given in milk or soapsuds, though much water would be improper. Care should be taken not to rupture the stomach by the tube of the stomach-pump or by inducing severe efforts at vomiting. The acid, when concentrated, discolours the mouth and lips, making a *black* slough. When administered medicinally it should be taken much diluted through a glass tube, in order to protect the teeth.]

EXTERNAL USE.

Strong sulphuric acid is the most powerful caustic of this group, rapidly charring and desiccating the tissues, from its great affinity for water. M. Velpeau, of Paris, strongly recommended its use in cancer, the acid being made into

a paste with saffron, and applied to the morbid growth, it being found, after detachment of the sloughs, that a clean ulcerating surface remained; and Professor Syme proposed a modification of this plan, on the score of economy, by using sawdust instead of saffron. Ricord, of Paris, also advises the application of sulphuric acid in combination with charcoal to [primary] *syphilitic ulcers*, holding that, if this process is effectually carried out before the fourth day, we may hope to avert the evil consequences of constitutional infection.

Mr. Pollock has advised the local use of strong sulphuric acid in *caries* and *necrosis* and suppurating synovial membrane of joints, either applied on a glass rod, or injected, or brought in contact on lint with the diseased surfaces, in the proportion of one part of acid to two, three, or six parts of water; and this plan of treatment has been used with good success in St. George's Hospital (*vide* "Lancet," May 28, 1870, and "Medical Times and Gazette," December 11, 1875).

INTERNAL USE.

Diluted sulphuric acid is a good astringent, and as such is extensively used [in night sweats and] in diarrhoea, more especially that which is so common in summer. It has also been advised, in the form of lemonade, as a prophylactic against *painters' colic*, and there is no doubt that it heightens materially the action of purgative salts, probably by increasing their solubility.

- | | | |
|----|---|--|
| R. | Magnesii sulphatis | ℥ij.; |
| | Ferri sulphatis | gr. xxiv.; |
| | Acidi sulphurici diluti | ℥℥ij.; |
| | Infusum calumbæ | ad ℥℥viij. |
| | Misce, fiat mistura. | Capiat cochlearia duo magna omni mane. |
| R. | Acidi sulphurici diluti | ℥℥ijss.; |
| | Tincturæ opii | ℥℥i.; |
| | Syrupi aurantii | ℥℥i.; |
| | Aquæ | ad ℥℥viij. M. |
| S. | Capiat unciam unam ter in die post singulas sedes liquidas. | |

[Succi.

The class of officinal Juices, U. S. P., consists of Succus Conii and Succus Taraxaci.]

TABACUM—TOBACCO.

[*The commercial dried leaves of Nicotiana Tabacum, U. S.*]

OFFICIAL PREPARATIONS, U. S.

Infusum Tabaci (℥j. to Oj.). Dose, f℥ij.—iv.**Oleum Tabaci.** Not used internally.**Unguentum Tabaci.** (Watery extract of leaves ℥j. to ℥xvj. of lard.)**Vinum Tabaci.** Dose, gtt. xx.

ANTIDOTES.

Strychnia and diffusible stimulants may be regarded as physiological antidotes to tobacco; and, after thoroughly washing out the stomach, tincture of digitalis may be exhibited to counteract the depressing influence of the poison on the heart, and the tendency to collapse. Respiration should be stimulated by ammonia, frictions, and even maintained artificially. Sulphate of strychnia may be given hypodermically, and stimulating enemata injected.]

EFFECTS AND USES.

Tobacco is now rarely, if ever, used in medicine, on account of its poisonous properties; but it is a substance in such general domestic use, and therefore of so great physiological interest, that we must devote some little space to considering the results of modern experiment on its action.

LOCAL ACTION.

Physiological.

Tobacco is readily absorbed by the skin, and symptoms of poisoning have followed the application of strong infusions to the unbroken cuticle.

Therapeutical.

Tobacco has been used as a local application in *prurigo* and other skin diseases, but is too readily absorbed to deserve recommendation for this purpose.

INTERNAL ACTION.

1. *Brain and Nervous System.*—The brain seems to be little affected, but some excitement of the spine is an

1. Before the introduction of chloroform, advantage was taken of the depressing and relaxing influence of

early symptom of the poisonous action of the drug, speedily followed, however, by muscular relaxation and paralysis, also of spinal origin.

The sensory nerves are not affected, but we find lowering of the functional activity of the motor nerves. The pupil is contracted.

tobacco on the muscular system to employ the enema in strangulated hernia and dislocations. Any occasional success, however, was amply counterbalanced by the inconveniences and even dangers which too often resulted; and this application of the drug has now fallen into well-merited oblivion.

In consequence of its lowering action on the reflex function of the spinal cord, it has been proposed as a remedy for tetanus and an antidote for strychnia, and the alkaloid nicotia will be found most convenient for these purposes.

The use of tobacco is believed to have some injurious effect on vision; and Hutchinson and others have recorded instances of atrophy of the optic nerve and total blindness thus produced.

2. *Circulation and Respiration.*—It is not necessary for us to go into the elaborate and contradictory series of experiments made to prove the fact that tobacco is a powerful depressant of the heart's action. The temperature usually falls in tobacco-poisoning, and death ensues from respiratory paralysis. [Excessive use of tobacco produces functional disorder of the heart, which may result in hypertrophy, dilatation, and organic disease.]

2. Tobacco-smoking has been known to give relief in asthma and chronic bronchitis.

3. *Digestive and Secreting Organs.*—Tobacco usually causes nausea and vomiting, as most smokers can testify; but toleration is soon established, and even considerable doses then fail to disturb the equanimity of the digestive organs, save a slightly purgative action on the bowels. It is stated, however, that in habitual smokers some symptoms of dyspepsia may be detected, indicated by furred tongue and loss of appetite; and there is also some generally-diffused, granular irritation about the pharynx.

[TAMARINDUS—TAMARIND.

The preserved fruit of Tamarindus Indica, U. S.

Tamarinds are laxative, and are used in making a refrigerant drink for the sick. They enter into the Confectio Sennæ.]

[TAPIOCA—TAPIOCA.

The fecula of the root of Manihot Manihot (Bot. Mag. 3071), U. S.

Tapioca, the starch of the Cassava plant, is used like arrowroot as an article of diet.]

TARAXACUM—DANDELION.

[*The root, gathered in the autumn, of Taraxacum Dens-leonis (De Candolle), U. S.*

OFFICINAL PREPARATIONS, U. S.

Extractum Taraxaci. Dose, gr. xx.—xxx.

Extractum Taraxaci Fluidum. Dose, fʒj.—ij.

Infusum Taraxaci (ʒij. to Oj.). Dose, fʒiv.

Succus Taraxaci. Dose, fʒij.—iv.]

Taraxacum is usually prescribed as a matter of routine

in sluggish liver and the various forms of *dyspepsia* depending on a supposed deficiency of bile; but although it may have some mild tonic, [diuretic, and aperient] properties, there is not the slightest evidence for asserting that it exerts any real influence over the hepatic functions.

R. Succi taraxaci	f℥j.;
Acidi nitro-muratici dil.	℥x.;
Tincturæ lupulinæ	℥xx.;
Aquæ	ad f℥j. M.
S. Ter die sumend.	

TEREBINTHINA—TURPENTINE.

[The concrete oleo-resin obtained from *Pinus palustris*, and from other species of *Pinus*, U. S.]

TEREBINTHINA CANADENSIS—CANADA TURPENTINE.

The liquid oleo-resin obtained from *Abies balsamea* (Lindley, Flor. Med.), U. S.

Enters into Ceratum Resinæ Compositum, Emplastrum Galbani Compositum (of Turpentine), and Charta Cantharidis and Collodium Flexile (of Canada Turpentine).

OLEUM TEREBINTHINÆ—OIL OF TURPENTINE.

The volatile oil distilled from the turpentine of *Pinus palustris* and of other species of *Pinus*, U. S.

Dose of oil of turpentine ℥x.—xx., given 3 or 4 times daily, in typhoid fever or chronic dysentery, or f℥j. to f℥ss. as a vermifuge.

OFFICIAL PREPARATION, U. S.

Linimentum Terebinthinæ.

And enters into Linimentum Cantharidis.]

LOCAL ACTION.

Physiological.

Turpentine, when applied to the skin, causes redness, tingling, and irritation, leading on to acute inflammation and blistering, if not removed within a limited period.

Therapeutical.

This effect of turpentine causes it to be much used as a counter-irritant in those cases where we wish to relieve congestion of internal organs by driving the blood

to the surface. Thus, in *peritonitis*, *pneumonia*, *bronchitis*, and *asthma*, it is frequently employed, either sprinkled on hot flannel, or in the form of the linimentum terebinthinæ of the Pharmacopœia.

CONSTITUTIONAL ACTIONS.

Physiological.

1. *On the Brain.*—Turpentine produces, in large doses, giddiness, and other symptoms somewhat resembling alcoholic intoxication, and even ending in coma in rare instances.

2. *Circulation.*—Turpentine acts at first as a stimulant to the heart, and has undoubted astringent properties, partly, no doubt, from its coagulating influence on the albumen of the tissues, but also by causing contraction of the smaller vessels.

3. *Digestive and Secreting Organs.*—Turpentine is distinctly irritating to the alimentary canal, frequently causing vomiting and diarrhœa, and it has the property of checking mucous secretions from the various canals.

It is also a very certain diuretic of the stimulating class, but must be used with

Therapeutical.

2. As an astringent, turpentine is valuable in various forms of *hæmorrhage*, but more especially in that from the *kidney* and in *purpura hæmorrhagica* [but is now rarely used as a hæmostatic, oil of erigeron Canadense, ergot, and the mineral astringents, being more reliable, and less irritating].

3. Turpentine is a valuable astringent in some forms of *diarrhœa*, and more especially that which results from the later and ulcerative stage of *enteric* [*typhoid*] *fever*. It is highly recommended in the same disease by some authorities when abdominal pain and distension coincide with a raw, clean, dry tongue, and in ordinary tympanites

caution, as it is apt to cause frequent and painful micturition with bloody urine, and eventual suppression of the secretion, [strangury,] and acute inflammation of the kidneys.

it makes a good addition to a purgative enema. It has been recommended by Dr. King Chambers as an enema in *sciatica*, where it is supposed to act locally on the affected nerve, which, at one part of its course, lies directly in contact with the large intestine, and it has long enjoyed a well-deserved reputation as an anthelmintic in cases of *tape-worm*.

Turpentine has also been given in small doses to check the excessive secretion in some forms of *bronchitis*, and it may also be of service in *chronic cystitis*, *gleet*, and *pyelitis*.

It has also been used in *iritis* with alleged success, though it is difficult to see on what principle.

MODE OF ELIMINATION.

Turpentine is rapidly absorbed into the blood, and as quickly passes out, principally by the lungs and kidneys, imparting to the urine a peculiar violet odor.

[Old oil of turpentine is considered an efficient antidote against phosphorus-poisoning.]

DOSE AND MODE OF ADMINISTRATION.

R. Olei terebinthinæ	℥j.;
Mucilaginis	℥v.;
Mistura amygdalæ,	
Aquæ laurocerasi [Br.]	āā ℥ss. M.
S. ℥j. pro dosi quartis horis.	

A few drops may be given on a lump of sugar, in hæmorrhage.

As an anthelmintic, half an ounce may be prescribed [combined with an ounce of castor oil, and is very effective against *round worms* as well as *tæniæ*].

[TESTA—OYSTER-SHELL.

The shell of Ostrea edulis, U. S.

OFFICIAL PREPARATION, U. S.

Testa Præparata. Dose, gr. x.-xl.

Calcined oyster-shell, consisting of 98 per cent. of carbonate of calcium, is used in impalpable powder as an antacid in dyspepsia. Castillon's powders consisted of sago, salep, tragacanth, each in powder, āā ʒj., prepared oyster-shell ʒj., and some cochineal as a coloring ingredient. A decoction of this powder in milk (ʒj. to Oij.) may be used freely as an article of diet in *bowel-affections*.]

[Tinctura.

The official Tinctures are:—

Tinctura Aconiti Radicis	Tinctura Hellebori
“ Aloes	“ Humuli
“ “ et Myrrhæ	“ Hyoscyami
“ Arnicæ	“ Iodinii
“ Assafoetidæ	“ “ Composita
“ Aurantii	“ Jalapæ
“ Belladonnæ	“ Kino
“ Benzoini	“ Krameriæ
“ “ Composita	“ Lobeliæ
“ Calumbæ	“ Lupulinæ
“ Cannabis	“ Myrrhæ
“ Cantharidis	“ Nucis Vomicae
“ Capsici	“ Opii
“ Cardamomi	“ “ Acetata
“ “ Composita	“ “ Camphorata
“ Castorei	“ “ Deodorata
“ Catechu	“ Quassia
“ Cinchonæ	“ Rhei
“ “ Composita	“ “ et Sennæ
“ Cinnamomi	“ Sanguinariae
“ Colchici	“ Scillæ
“ Conii	“ Serpentariae
“ Cubebæ	“ Stramonii
“ Digitalis	“ Tolutana
“ Ferri Chloridi	“ Valerianæ
“ Gallæ	“ “ Ammoniata
“ Gentianæ Composita	“ Veratri Viridis
“ Guaiaci	“ Zingiberis.]
“ “ Ammoniata	

TRAGACANTHA—TRAGACANTH.

[*A gummy exudation from Astragalus verus (Olivier), and from other species of Astragalus, U. S.*

OFFICIAL PREPARATIONS, U. S.

Mucilago Tragacanthæ, as a vehicle.

Trochisci Acidi Tannici, Trochisci Ipecacuanhæ, Trochisci Potassii Chloratis, Trochisci Santonini, and Trochisci Zingiberis.]

Tragacanth is of service as a vehicle for the suspension and division of various powdered drugs.

[Trochisci.

The official Lozenges are:—

Trochisci Acidi Tannici	Trochisci Menthæ Piperitæ
“ Cretæ	“ Morph. et Ipecacuanhæ
“ Cubebæ	“ Potassii Chloratis
“ Ferri Subcarbonatis	“ Santonini
“ Glycyrrhizæ et Opii	“ Sodii Bicarbonatis
“ Ipecacuanhæ	“ Zingiberis.]
“ Magnesizæ	

ULMUS—SLIPPERY-ELM.

[*The inner bark of Ulmus fulva (Michaux), U. S.*

OFFICIAL PREPARATION, U. S.

Mucilago Ulmi.]

Elm bark is probably tonic and astringent, but is rarely if ever used [except as an emollient application in external inflammations, such as erysipelas].

[UVA PASSA—RAISINS.

The dried fruit of Vitis Vinifera, U. S.

Raisins are laxative, and are used as a flavoring to demulcent beverages. They enter into the tincture of rhubarb and senna.]

UVA URSI—BEARBERRY.

[*The leaves of Arctostaphylos Uva Ursi (Sprengel, Syst., II. 287), U. S.*

OFFICIAL PREPARATIONS, U. S.

Decoctum Uvæ Ursi (ʒj. to Oj.). Dose, fʒiv.

Extractum Uvæ Ursi Fluidum. Dose, fʒj.]

Uva ursi is astringent and possibly diuretic. [It is also tonic and antilithic, and is believed to favor uterine contraction.]

The astringency of this drug being principally directed to the genito-urinary mucous membrane, it is held by surgeons to be of some service in various chronic affections of these parts.

VALERIANA—VALERIAN.

[*The root of Valeriana officinalis, U. S.*

OFFICINAL PREPARATIONS, U. S.

Extractum Valerianæ. Dose, gr. x.—xxx.

Extractum Valerianæ Fluidum. Dose, fʒj.

Infusum Valerianæ (fʒss. to Oj.). Dose, fʒij.—iv.

Oleum Valerianæ. Dose, gtt. iv.—v.

Tinctura Valerianæ (ʒij. to Oj.). Dose, fʒj.—ij.

Tinctura Valerianæ Ammoniata (ʒij. to Oj.). Dose, fʒj.—ij.]

EFFECTS AND USES.

Various elaborate investigations have been made in Germany on the physiological actions of valerian, but they have not much bearing on its practical application, and the drug itself is hardly of sufficient importance to justify us in devoting much time to its consideration. We may therefore say, generally, that acceleration of the action of the heart, mental hallucinations, giddiness, and some digestive derangement are among the principal of the symptoms described most fully by Phillips.

The more important therapeutic applications of valerian have not stood the test of time and experience, and its use is now practically restricted to *hysteria* and the various nervous conditions depending thereon. [In *nervous headache*, the ammoniated tincture is a reliable resource in doses of fʒij.

The oil is the active principle.]

[ACIDUM VALERIANICUM—VALERIANIC ACID.]

A colorless liquid, of an oily consistence, a penetrating disagreeable odor, and caustic taste. Its specific gravity is 0.935. U. S.

OFFICIAL PREPARATIONS, U. S.

Ammonii Valerianas. Dose, gr. ij.—v.

Quiniæ Valerianas. Dose, gr. j.—ij.

Zinci Valerianas. Dose, gr. j.—ij.

PROPERTIES.

Valerianic acid is an example of an organic acid made by synthesis, through the oxidation of amylic alcohol (fusel oil) by chromic acid. The valerianate of the oxide of amyl makes an artificial fruit-essence, when largely diluted.

Valerianic acid resembles valerian in its effects, and, in the form of the valerianates, may be used in *nervous headache, neuralgia, and hysteria*. The salts are best given dissolved in simple elixir or in pill.]

[VANILLA—VANILLA.]

The prepared unripe fruit of Vanilla aromatica, U. S.

Used as a flavoring ingredient in Trochisci Ferri Subcarbonatis, and Trochisci Potassii Chloratis.]

VERATRUM ALBUM—WHITE HELLEBORE.

[The rhizome of Veratrum album, U. S.]

White hellebore possesses some of the physiological properties of veratrum viride, but much of its energy is expended on the alimentary canal, and violent vomiting and purging often follow its use. It is, therefore, now quite discarded from medical practice. When applied to the nostrils, it causes intense sneezing.

Two alkaloids [in addition to veratria] have been discovered in the root-stalk, one of which has been called jervia, and the other veratralbia.

[For Veratria see Sabadilla.]

VERATRUM VIRIDE—AMERICAN HELLEBORE.

[*The rhizome of Veratrum viride, U. S.*]

OFFICIAL PREPARATIONS, U. S.

Extractum Veratri Viridis Fluidum. Dose, gtt. j.—iiij.**Tinctura Veratri Viridis** (℥viiij. to Oj.). Dose, gtt. iiij.—vj.

(Dr. Norwood's tincture is of the same strength as the official tincture.)]

Some local action has been observed, of an irritant nature, somewhat resembling that of veratria.

CONSTITUTIONAL ACTIONS.

*Physiological.**Therapeutical.***I. Brain and Nervous System.**—1. Green hellebore has no action on the brain.2. *Spinal Cord.*—A very decidedly depressing effect is exerted on the spine, indicated by extreme muscular prostration.**II. Heart and Circulation.** Veratrum viride is also a powerful vascular depressant, the pulse rate being lowered, and the arterial tension diminished; these effects being due both to a direct action of the drug on the heart muscle and to stimulation of the cardiac inhibitory nerves.II. Veratrum viride has been extensively used in America on account of its depressing influence on the circulation, and it is stated that we may get good results by prescribing it in the early stages of *pneumonia* and other inflammatory conditions. Little or no English experience, however, has yet been brought to bear on the discussion of this question.**III.** No effect is produced on the respiration, but a distinct lowering of temperature has been observed.

IV. *Digestive and Secreting Organs*.—Veratrum viride has emetic properties, and frequently causes vomiting; and purging, also, not unfrequently follows its use.

[IV. The nauseating and depressing effects are best counteracted by opium and alcoholic stimulants.]

Two alkaloids exist in veratrum viride, jervia and veratroida, the main difference between which seems to be, that the latter is apparently responsible for the digestive disturbance which occasionally results.

[Vina.

The officinal Wines are:—

Vinum Aloës	Vinum Opii
“ Antimonii	“ Portense
“ Colchici Radicis	“ Rhei
“ “ Seminis	“ Tabaci
“ Ergotæ	“ Xericum.]
“ Ipecacuanhæ	

ZINCUM—ZINC.

[OFFICIAL PREPARATIONS, U. S.

Zinci Oxidum. Dose, gr. ij.—vij.

Zinci Oxidum Venale.

Unguentum Zinci Oxidi (1 to 5).

Zinci Chloridum. As a caustic and astringent.

Liquor Zinci Chloridi. (Burnett's Disinfecting Fluid.)

Zinci Acetas. As a collyrium, gr. ss.—ij. to fʒj.

Zinci Carbonas Præcipitata.

Ceratum Zinci Carbonatis (1 to 5).

Zinci Sulphas (white vitriol). Dose, as an emetic, gr. x.—xxx.

Zinci Valerianas (given in pill). Dose, gr. i.—ij.

ANTIDOTES.

The alkalies and alkaline carbonates are the chemical antidotes to the salts of zinc. Evacuation of the stomach and bowels should be followed by the exhibition of eggs and milk. The retching, colicky pains, and diarrhœa, may be relieved by morphia hypodermically.]

LOCAL ACTIONS.

Physiological.

CHLORIDE OF ZINC is an exceedingly powerful caustic, and, in weak solution, has astringent properties. The sulphate and oxide are also astringent in varying proportions.

Therapeutical.

CHLORIDE OF ZINC has been used as a caustic for the treatment of cancerous and other ulcerations, either in strong solution, substance, or arrow-shaped masses made with flour, and inserted into incisions around the base of the morbid mass. It has turned out to be the principal ingredient in all so-called cancer curers' nostrums, and is employed in legitimate surgery as an application to wounds from which *cancerous growths* have been removed, and also (in the strength of gr. lx. ad f3j.) to the raw surface after ordinary operations, with the view of preventing pyæmia.

SULPHATE OF ZINC is a much-valued astringent lotion in *conjunctivitis*, and makes an excellent injection in *gonorrhæa* and *leucorrhæa*; and the oxide, either in powder or ointment, is one of the most useful applications in chronic skin-disease.

INTERNAL ACTIONS AND USES.

Physiological.

1. *Action on Nervous System.*—This is probably tonic in character, and some astringent properties may also be noted.

Therapeutical.

1. We can thus explain the benefit which sometimes results from the use of sulphate of zinc in *chorea*. We here begin with a grain, and continue in gradually in-

creasing doses up to 6 or 8 grains, tolerance being rapidly established, and the emetic action of the drug avoided. Oxide of zinc, in doses from 1 to 5 grains, is an excellent remedy in the *night-sweats* of phthisis, and it is also a valuable aid to treatment in the *diarrhœa* of children.

2. *On Digestive System.*—Sulphate of zinc promptly and effectually empties the stomach, without causing much depression or nausea.

2. It is therefore our most reliable direct emetic, invaluable in cases of poisoning, in doses of from 20 to 30 grains.

R. Zinci sulphatis gr. xxx.;
Aquæ fʒiij. M.
Fiat haustus emeticus statim sumendus.

R. Zinci chloridi gr. j.;
Aquæ rosæ fʒiv. M.

A good injection in gonorrhœa.

R. Zinci oxidi ʒij.;
Glycerini fʒij.;
Liquor plumbi subacetatis fʒiss.;
Aquæ calcis ad fʒvj. M.
Fiat lotio.

Useful in impetigo.

R. Zinci valerianatis gr. xxiv.;
Confectionis rosæ q. s.
Fiat massa in pilulas duodecim dividenda. Deaurentur pilulæ.

Nervine tonic.

ZINGIBER—GINGER.

[*The rhizome of Zingiber officinale* (Roscoe, *Trans. Linn. Soc.*), U. S.

Dose, in substance, gr. x.—xv.

OFFICIAL PREPARATIONS, U. S.

Extractum Zingiberis Fluidum. Dose, ʒx.—xx.

Infusum Zingiberis (ʒss. to Oj.). Dose, fʒij.—iv.

Oleo-resina Zingiberis. Dose, ʒss.—ij.

Syrupus Zingiberis. As a vehicle.

Tinctura Zingiberis (3iv. to Oj.). Dose, f3ss.-j.

Trochisci Zingiberis (each containing ℥ij. of the tincture.).

Also enters into Acidum Sulphuricum Aromaticum, Pilulæ Scillæ Compositæ, Pulvis Aromaticus, Pulvis Rhei Compositus, and Vinum Aloes.]

Ginger is an agreeable stimulant and carminative.

Having now completed the study of the various articles contained in the national Pharmacopœia, we shall proceed to give a brief *résumé* of the properties of the most useful among those drugs which have not yet received full official sanction. Among these will be found some very important remedies, in addition to plants of great physiological interest, whose active medicinal powers have not yet been fully tested in practical medicine, and whose investigation opens up a valuable field for clinical observation.

REMEDIES IN FREQUENT USE, BUT NOT INCLUDED IN THE PRIMARY LIST OF THE MATERIA MEDICA, U. S. P.

[AZEDARACH—AZEDARACH.

The bark of the root of Melia Azedarach, U. S. Secondary.

The bead-tree, or Pride of China, is largely used in the Southern States as an *anthelmintic*, resembling spigelia in its effects. The decoction (℥ij. to Oij. boiled to Oj.) is generally employed; the dose to a child being a table-spoonful frequently repeated, until it purges.]

BRAVERA—KOOSSO.

[The flowers and unripe fruit of Brayera anthelmintica, U. S. Secondary.]

EFFECTS.

Physiological.

The action of kousso is poisonous to the tape-worm, without exerting any irritating or purgative effect.

Therapeutical.

It is therefore occasionally used as an anthelmintic, and with moderately good effect when given on an empty stomach, according to the rules generally laid down.

MODE OF ADMINISTRATION, &c.

It is well not to use the officinal tincture [Br.], but to get the fresh flowers, boiling about half an ounce in 3 or 4 oz. of water, adding a little lemon-peel, and directing the patient to swallow the whole draught, dregs and all. A little vomiting sometimes follows, but is seldom troublesome. [A brisk cathartic should follow in 3 or 4 hours.]

ARECA—[BETEL NUT, PH. B.].

This nut possesses some astringent properties, and has been used with success as an anthelmintic.

BELÆ FRUCTUS—INDIAN BAEI [PH. B.].

Indian bael, containing tannin, has astringent properties, and has been highly praised as an effectual cure for the more chronic forms of *dysentery*. Only partial confirmation is given by home experience to the evidence furnished from abroad; but this may be explained not only by the limited opportunities of testing its efficacy in this country, but because the drug is probably much more active when used in a perfectly fresh state.

CURCUMA—TURMERIC.

[*The rhizome of Curcuma longa, U. S. Secondary.*]

Turmeric is not used in medicine. It forms the coloring ingredient in curries, and the theory has recently been broached that the yellowish tint so often observed on the skin of Anglo-Indians results from the absorption of the pigment of this substance.

EUCALYPTUS GLOBULUS [PH. B.].

Eucalyptus is an excellent antiseptic, proving rapidly destructive to infusoria.

It paralyzes the spinal cord and medulla, a period of preliminary excitement rapidly giving way to profound muscular weakness, loss of reflex activity, and finally death from respiratory failure.

The pulse loses in force, the temperature is lowered, and the excretion of urea is increased.

As regards the therapeutics of the drug, it appears to have been used with success as an antiperiodic; and there seems to be no doubt that the presence of the plant in large numbers deprives malarious districts of much of their virulence.

It has also been recommended in *bronchitis* and *asthma*.

Dose of the tincture, f3ss. to f3ij. [The fluid extract may also be used, but the oil is the best preparation. Dose, gtt. v.-x.]

FEL BOVINUM PURIFICATUM—PURIFIED OX-BILE [Ph. B.].

Bile is well known to act as a laxative, to aid the digestion of the fatty and amylaceous constituents of our diet, and to prevent the decomposition of food within the intestines, with consequent flatus and digestive disturbance.

It has therefore been supposed that when a deficiency of bile is suspected, we may hope to derive advantage from ox-gall administered in gelatine capsules, so that its action may be deferred until it reaches the small intestines. In some forms of *dyspepsia* and in *chronic diarrhoea* it is said to be a useful remedy, but little clinical evidence on this point can be adduced.

GOA POWDER—[ARAROA].

Has been extensively used in the East, recommended by Sir Joseph Fayrer in cases of *ringworm* and *psoriasis*. We may dissolve a scruple in an ounce of hot lard to make an ointment.

Prof. Attwood having discovered that chrysophanic acid is the principal ingredient of Goa powder, Mr. Balmanno Squire has proved the efficacy of this substance in the same class of cases, making an ointment also with hot lard in the proportion of ʒij. to ʒj.

JABORANDI.

CONSTITUTIONAL ACTION.

Physiological.

Within ten or twelve minutes after jaborandi has been taken, the face flushes deeply, and profuse perspiration follows, accompanied by a great increase of salivary secretion. The loss of fluid thus produced is very considerable, and the sweat has been proved to contain a

Therapeutical.

The powerful diaphoretic action of jaborandi, no less than its power in aiding the elimination of urea, would seem to suggest its use in various chronic *kidney-diseases* [Bright's disease], as well as febrile conditions. But its action is too short, sharp, and sudden, and too

large excess of urea. This action on the skin is considered due to vaso-motor paralysis and consequent dilatation of the cutaneous arterioles, and the sialogogue effects of the drug are attributed to stimulation of the periphery of the nerves supplied to the salivary glands. Jaborandi increases somewhat the action of the heart; and contraction of the pupil, with impaired accommodative power, has been noted to attend its use.

A good deal of nausea, depression, and general discomfort result, and have been graphically described by Mr. Martindale in the "Lancet."

Atropia appears to be in many respects an exact physiological antidote to jaborandi.

[The alkaloid of Jaborandi possessing both the diaphoretic and sialogogue actions of the drug, has received the name of—

much depression and inconvenience are produced, to render us very hopeful of its ultimate success in practice.

It has been prescribed in *diabetes insipidus*, and for the purpose of augmenting the secretion of milk.

Pilocarpia—Pilocarpin.

CONSTITUTIONAL EFFECTS.

Physiological Effects.

Dr. Popow (*St. Petersburg Med. Woch.*, Aug. 4), reporting upon the results derived from the hypodermic injection of pilocarpin in men in health and suffering from fever, and in experiments upon animals made in Prof. Suschtschinsky's labo-

Therapeutic Uses.

From some comparative trials which he has made with the internal administration of pilocarpin, Dr. Curschmann believes that the infrequency with which it causes vomiting, as compared with jaborandi, is principally due to its being used

ratory, comes to the following conclusions:—

1. Pilocarpin produces the same effect as an infusion of the leaves of jaborandi.

2. An injection of from 0.01 to 0.02 gramme (gr. $\frac{1}{6}$ to $\frac{1}{3}$) induces abundant sweating, without causing the unpleasant effects (giddiness, vomiting, cephalalgia) produced by jaborandi, and is, therefore, better suited for therapeutical employment.

3. The temperature diminishes without any prior exaltation, from one hour and a half to four hours, and reaches its minimum soon after the cessation of the sweating.

4. The increased excretion of saliva is observed alike in the healthy and the sick, after doses of from 0.01 to 0.015 gramme (gr. $\frac{1}{6}$ to $\frac{1}{4}$). Sweating only occurs in such doses in the healthy; fever patients, *e. g.*, typhus, requiring 0.02 gramme (gr. $\frac{1}{3}$).

5. The quickening of the heart's action produced by the pilocarpin continues a pretty long time after small doses, but when large ones are employed, this is soon replaced by retardation.

6. On the direct introduction of pilocarpin into the veins a retardation of the heart's action takes place

hypodermically, and thereby avoiding direct irritation of the stomach. Some persons, especially those who have been weakened by prior disease, complain of a sense of debility, but this usually soon passes off; but in others a complete state of collapse is produced, which may or may not be connected with prior vomiting. The possibility of this occurrence must always be borne in mind. It is dependent upon the amount of the dose and the susceptibility of the individual. It is oftenest met with in women, and in those whose strength has been greatly reduced; and when the patient's constitution is not known, the first dose of the medicine should not exceed 0.02 (gr. $\frac{1}{3}$), while its effect should be watched for a quarter or half an hour. As far as the trials have gone, pilocarpin does not seem to act dangerously on the subjects of heart-disease, and, indeed, can be employed when no other diaphoretic procedure, for so long a period, would be ventured upon. Indeed, as a therapeutical agent for the production of diaphoresis, it is superior to any other method in use, being more easily employed, while its action is more certain and more complete, without being more,

suddenly, without any prior acceleration.

7. Doses not exceeding 0.03 gramme (gr. $\frac{1}{2}$) do not exert any particular effect on the alimentary canal; but large doses, 0.05 to 0.10 gramme (gr. $\frac{5}{8}$ to gr. jss.) induce purging, or even bloody stools, with intestinal movements, and the development of gases.¹

or even as dangerous, as most of these. Its superiority over the various sweating-baths in *ascites*, *hydrothorax*, *asthma*, etc., is most marked. It is true that diaphoretic treatment is thought less of than formerly; but in several cases the difficulty of its application, rather than its inefficacy, is the cause of its not being resorted to. Speaking from his own experience, Dr. Curschmann has found the pilocarpin very useful in *œdema*, in *dropsy* of the cavities from heart or lung disease, and in *chronic nephritis*, etc., and that after diuretic, drastic, and other means have failed. He believes that a large field for its employment may be found in *pleurisy*, accompanied by serous exudation, both in promoting the absorption of this, and in preventing its re-accumulation after paracentesis. It is evidently indicated in *chronic rheumatic affections*, at least so far as these are amenable to diaphoretic treatment.²

MODE OF ACTION ON SALIVARY GLANDS.

Mr. J. N. Langley (Journal of Anatomy and Physiology, Oct. 1876) gives the following as the results of ex-

¹ [Medical News and Library, Phila., Oct. 1877, p. 154; from the Med. Times and Gaz., Aug. 25, 1877.]

² [Phila. Med. and Surg. Reporter for Oct. 6, 1877.]

periments made by him to determine the action of pilocarpin on the submaxillary gland of a dog:—

"In small doses, *i. e.* up to 30 mgr. (gr. $\frac{1}{2}$), pilocarpin exerts an action on the gland very similar to that produced by stimulation of the chorda tympani.

"It causes a rapid secretion and a considerable increase of blood-flow; both secretion and blood-flow gradually declining.

"Its effects are little if at all altered by sections of the chorda tympani or of the sympathetic nerve. Stimulation of the chorda tympani increases the pilocarpin effects, *i. e.* the nerve is functionally unaltered. Stimulation of the sympathetic diminishes its effects, so that this nerve, too, is functionally unaltered. The secretion is stopped by injecting atropia (a fact for some time known), but a quantity of atropia sufficient to paralyze the chorda tympani does *not* prevent a relatively large quantity of pilocarpin from producing its ordinary results. In fact, the secretion or absence of secretion is dependent on the relative quantity of the two poisons present, just as in the stand-still or beat of the heart.

"In *larger doses*, instead of causing a stronger salivary flow, it causes none at all, and further prevents the chorda tympani from producing any secretion. It considerably diminishes the blood-flow through the gland, as well as the effects of the chorda tympani on the blood-flow.

"It does not, however, stop the sympathetic secretion. The action indeed is not very dissimilar to that of atropia; this agrees with its action on the vagus and inhibitory apparatus of the heart, where in large doses it prevents any inhibition of the heart from stimulation of the vagus, or of the junction of sinus venosus, just as atropia does."¹

MODE OF ADMINISTRATION, AND DOSE.

The infusion of the powdered leaves is a good method of exhibiting the drug. A drachm should be steeped in half a pint of hot water, and when sufficiently cool stirred up and one-half the quantity drunk, half an hour later the remainder should be taken, without straining the infusion. This is generally sufficient to cause profuse sweating within an hour. Ptyalism is less con-

¹ [Am. Journ. Med. Sci., Jan. 1877.]

stant in its occurrence. Drs. Tyson and Bruen¹ have determined that the amount of urine and the excretion of urea are both increased during the twenty-four hours succeeding the administrations.

The ordinary dose of pilocarpin is gr. $\frac{1}{2}$. Gerrard also found that the nitrate and hydrochlorate of pilocarpin in doses of one-half a grain, also produced the full effects of jaborandi in substance.

The fluid extract of jaborandi is now largely used, the dose being a fluid-drachm, representing a drachm of the leaves. An elixir is also made by some pharmacists containing the virtues of one drachm in six fluid-drachms. Dose f3j.-f3ss.]

[LIQUOR FERRI DIALYSATUS—SOLUTION OF DIALYSED IRON.

(Not officinal.)

This preparation, of recent introduction, is rapidly coming into favor. It is a clear, neutral, very deep wine-colored liquid, free from taste and apparent astringency, and bearing perfectly dilution with pure water.² It is a pure and powerful chalybeate with all the advantages of iron in the usual form; it is borne well by the stomach, and does not cause constipation nor distress the digestion. Chemically it would appear to be a ferric hydrate kept in solution by a small quantity of ferric chloride. It is made by precipitating ferric chloride with dilute water of ammonia, washing the ferric hydrate precipitated, dissolving it in a solution of ferric chloride, and placing the result in a dialyser. Graham, the inventor of the process, believed that muriatic acid passes through the dialyser, mainly, and that the iron is left in the form of the soluble, colloidal, ferric hydrate; but in practice it has never been obtained entirely free from the chloride. Dialysed iron would seem to furnish us with an efficient substitute for the hydrated sesquioxide in the treatment of *poisoning by arsenious acid*. It is precipitated by various salts, and should be administered alone in doses of from ten drops to half a drachm, after meals. It claims to contain about the same

¹ [Am. Journ. Med. Sci., July 1, 1877.]

² [Phila. Med. Times, vol. vii. p. 492, article on Dialysed Iron.]

proportion of iron as the muriated tincture, and, as it is said not to injure the teeth, it proves an admirable substitute for it, in *chlorosis*, *anæmia*, and allied conditions.]

ROTTLERA—KAMALA, U. S. SECONDARY.

[*The glandular powder and hairs obtained from the capsules of Rottlera tinctoria* (Roxburgh), U. S.]

Dose, ʒj.-iij.]

EFFECTS.

Physiological.

Kamala is a vermicide, killing the tape-worm rapidly; it also possesses purgative properties.

Therapeutical.

Kamala is an efficient anthelmintic, differing from other remedies of the class in its cathartic action.

LARICIS CORTEX—LARCH BARK [Ph. B.].

Larch bark is seldom if ever used in medicine.

LAUROCERASI FOLIA—CHERRY-LAUREL LEAVES [Ph. B.].

This drug contains prussic acid, but, as it is very variable in strength, its use cannot be advised.

MORI SUCCUS—MULBERRY JUICE [Ph. B.].

Is only used as a flavoring ingredient.

[PEPSINA PORCI]—PEPSIN.

Pepsin is the most important digestive element of the gastric juice, and more especially reduces the albuminoid and proteinaceous constituents of food to a fit state for absorption.

There can be little doubt that many dyspeptic conditions are due to a deficiency of gastric juice, and attempts may be made to supply this by prescribing pepsin, preferably in combination with dilute hydrochloric acid.

In *atonic dyspepsia*, in various *anæmic* and *cachectic* conditions, in the *diarrhœa* of *children*, in some forms of

spasmodic asthma, its use seems to be attended with good results; but we may well share Dr. Wood's scepticism as to the possibility of materially aiding the digestion of food by the small doses usually prescribed.

Pepsin has also been recommended as an addition to nutritious enemata, so as to insure some preliminary digestion of the injected food.

Dose, 2 to 5 grains. Or we may use Prof. Liebreich's Pepsin-Essenz. [It may be conveniently prescribed in the form of Saccharated Pepsin, Liquor Pepsini, Boudault's Acid Pepsin, or as Lacto-peptine.]

[PETROSELINUM—PARSLEY.

The root of Petroselinum sativum (Lindley, Flor. Med.),
U. S. Secondary.

The neutral, active principle, APIOL, has attained some reputation in the treatment of *intermittents*, and is also used in *neuralgia* and *dysmenorrhœa*. Its nauseating taste requires it to be given in capsule (gr. 3 $\frac{9}{16}$). Dose, one to four.]

RHAMNI SUCCUS—BUCKTHORN [Ph. B.].

Buckthorn has some purgative properties, but is never used in modern practice.

SALICIN.

Salicin acts as a bitter tonic, and has some antiseptic and antiperiodic qualities, which have caused it to be used, with only partial success, in the treatment of *malarial affections*. Recently, however, it has been most extensively employed, on the recommendation of Dr. Maclagan, as a remedy for *acute rheumatism*, in which disease from 10 to 30 grains, every two, three, or four hours, in powder mixed with water, generally succeeds, within forty-eight hours, in relieving pain and reducing temperature.

ACIDUM SALICYLICUM—[SALICYLIC ACID].

LOCAL ACTION.

Physiological.

Salicylic acid is an excellent antiseptic, delaying putrefaction and preventing decomposition.

Therapeutical.

Being less irritant than carbolic acid, it has been proposed as a substitute for that substance in carrying out Lister's antiseptic system. It has also been recommended as a good lotion to raw surfaces; but Callender has shown that it not only tends to irritate the wounds, but frequently brings out a crop of irritable vesicles in their neighborhood.

CONSTITUTIONAL ACTION.

Salicylic acid is an antiseptic and antipyretic, rapidly reducing temperature in feverish conditions, although, in a state of health, the drug seems to be without influence on the body heat. Some headache, giddiness, and ringing in the ears have been observed, but the cardiac and respiratory functions are not sensibly affected.

Elimination principally takes place by the urine.

Salicylic acid is now universally allowed to be a most efficient remedy in *acute rheumatism*, very rapidly reducing temperature, relieving pain, and, in fact, cutting short the disease. By shortening the duration of the joint inflammation, it naturally limits the tendency to cardiac complication; but it seems to have no influence over developed pericarditis, or in averting or arresting conditions of hyperpyrexia.

DOSE, MODE OF ADMINISTRATION, &c.

We may give salicylic acid in 20-grain doses, repeated hourly for six hours on two consecutive days, and continued at shorter intervals, if the disease resists forty-eight hours' medication.

The disadvantages attending its use are an unpleasant burning sensation in the throat, with the occasional devel-

opment of catarrhal symptoms ; gastro-intestinal irritation, resulting probably from an impure preparation containing carbolic acid ; and a peculiarly irritable erythematous and vesicular inflammation of the skin. A still more formidable objection, however, to its long-continued use, is the property it seems to possess of softening the long bones, and injuriously affecting the teeth by abstracting their salts of lime.

Salicylic acid is very insoluble, and it is difficult to find a ready medium for its administration. Messrs. Savory and Moore have devised a very elegant granular, effervescent preparation, or we may use the salicylate of soda in 10-grain doses. The following are good formulæ :—

R. Acidi salicylici	3j. ;
Olei amygdalæ [expressi]	13v. ;
Pulv. acaciæ	3ijss. ;
Syrupi amygdalæ	13vj. ;
Aquæ aurantii flores	ad 13ij. M.
S. Capiat f3j. pro dosi.	

For children.

Or,

R. Acidi salicylici	3j. ;
Sp. rect.	13ijss. ;
Dissolve.	
Potassii citratis	f3j. ;
Syrupi aurantii	f3ij. ;
Aquæ	13ijss.
Mix the two solutions and filter, and then dilute with water to taste.	

[NOTE.—Prof. Germain Sée has just read at the Academy of Medicine, an elaborate memoir (which is published in detail in the *Union Médicale* of July 3 *et seq.*) entitled “Studies on Salicylic Acid and the Salicylates ; and on the Treatment of Acute and Chronic Rheumatism, Gout, and various Affections of the Sensory Nervous System, by the Salicylates,” in which he speaks of this new article of the materia medica in most enthusiastic terms. He treats at full length of the history, chemistry, physiological and therapeutical action of this substance ; but we have only space for transcribing his conclusions as to its therapeutical effects.

“1. As an external antizymotic agent, salicylic acid has an incontestable action, but in no wise superior to that of carbolic acid, its only advantage being its privation of odor. As an internal antiseptic, it manifests no appreciable effect in either purulent affections or contagious and parasitical diseases—as diphtheria, or muguet, or gangrene, or finally in diabetes.

“2. As an antipyretic, salicylic acid and the salicylates possess only transitory and doubtful properties, even when specific, miasmatic, viru-

lent fevers, etc., are in question. Even the salicylate of quinia occupies no definite position in the treatment of marsh fevers. Powerless in the treatment of smallpox, the salicylate of soda has not been sufficiently tried in typhoid fever. Its febrifuge power is exceedingly limited.

"3. It is in acute articular rheumatism that the most certain and most prompt effects are observed—so much so that we may promise with almost certainty the cure of febrile or apyretic acute rheumatism within a space of from two to four days. Fifty-one cases may be adduced in proof of this.

"4. In simple chronic rheumatism the trials which I have made have proved most satisfactory. The same may be said of the acute crises which manifest themselves from time to time in simple rheumatism or in chronic rheumatic arthritis, the painful attacks of which cease as soon as in acute rheumatism. Moreover, the articular tumefactions considerably diminish, and the motions of the joints may become free even after years of pain, rigidity, and immobility—on the condition that the bony lesions have not become too deep-seated or too advanced. Twelve cases of chronic rheumatism either cured or ameliorated are adduced.

"5. But it is in acute and chronic gout that the results are the most remarkable. From the commencement of my observations I was struck by the promptitude with which the most painful acute paroxysms were arrested. Within the space of two or three days the pains, the articular fluxion, the redness of the skin, and the sensibility to touch had all disappeared. Chronic gout is just as amenable to the salicylic treatment. Continued, even in moderate doses, it affords the patients absolute security from an acute attack. The tophi of the joints diminish in size, and cease to become inflamed—in a word, the cure is complete, and that without the production of any metastasis to the heart, stomach, respiratory organs, or the brain. Not once have I been able, among the twenty-one cases I have watched, to observe the slightest retrocession of gout inwardly. No other inconvenience has been produced than the production of some disturbances in the ear, and sometimes a certain amount of debility or narcotism. The two latter phenomena disappear when the dose is diminished; but the perturbations of audition are much more persistent. Among affections which are often of a gouty nature, gravel may be mentioned. This is favorably modified, or rather more easily eliminated, by the aid of salicylate of soda, which also has the advantage of allaying the nephritic pains.

"6. The salicylic treatment has seemed to be of advantage in certain facial neuralgias; but its action in this affection is not definitively established, and the same may be said with regard to sciatica.

"7. In painful affections of the spinal cord, the salicylate of soda produces calming effects which are distinctly appreciable; but by the continuance of its employment a certain amount of debility is produced."]¹

SUMBUL

Has antispasmodic properties, but is very rarely prescribed.

¹ [From the Monthly Abstract of Medical Science, Philadelphia, for September, 1877.]

TRIMETHYLAMINE AND ITS HYDRO-
CHLORATE.

Lowering of temperature and pulse is said to follow the use of this drug, and it has been much recommended as a remedy for *acute rheumatism*.

Dose of the hydrochlorate, 3 to 10 grains.

LEECHES.

[*Hirudo. Sanguisuga Officinalis.*]

Leeches are undoubtedly the most convenient means for the local abstraction of blood, and are used to relieve pain, which they do very effectually in certain local inflammations, as *pleurisy, pericarditis, orchitis, iritis, hepatitis, peritonitis*; and there is reason to believe that, when applied sufficiently early, they may even moderate the inflammatory process. Their action, no doubt, may frequently be explained by direct vascular communication between superficial vessels and those of deeper parts.

Each leech may contain about $1\frac{1}{2}$ dr. of blood, and subsequent fomentation may draw so much more from the skin as to raise the total amount up to half an ounce. Should the subsequent bleeding prove difficult of arrest, as sometimes happens, we may succeed in staunching the flow by means of pressure, cold, various astringents, the application of solid nitrate of silver, or the twisted suture. [The American only takes about $\frac{1}{2}$ as much blood as the imported leech, and, on this account, is preferred by some in the treatment of diseases of children.]

Special cautions in the use of leeches are—never to apply them, if possible, to any part over which firm pressure cannot subsequently be made, as the larynx; not to apply them in the evening, when, for some unexplained reason, the bleeding is more apt to be troublesome; and, of course, never to allow their use in any victim of the hæmorrhagic diathesis.

If leeches will not bite, we must smear the skin with cream or freshly-drawn blood, or immerse the animal itself in porter, which seems to have a stimulating effect; and should one be unfortunately swallowed, we can kill it, and cause its expulsion from the stomach, by common salt.

QUESTIONS.

IN submitting a series of questions to the consideration of the student, I have endeavored to place various suggestive points before him in interrogative form, and to approach the border line between practical medicine and therapeutics by introducing a few short illustrative cases. The principle seems to me worthy of further development, and a systematic collection of typical diseases, with variations and exceptions and bed-side gleanings, might lead the way profitably up to those diffuse collections of symptoms which are occasionally rolled into concrete form by our examining boards.

It would not be difficult to expand my collection of queries to an almost unlimited extent; but the conscientious attempt to answer those already constructed will at all events encourage the young reader to think for himself, and to emancipate his mind and memory from the enervating trammels of the more grinding forms of manuals.

1. A child is under treatment for whooping-cough, and the mother states that after each dose of his medicine his face flushes, and he complains of his throat being very dry. What drug is most likely to produce these symptoms?

2. Mention the different remedies to be employed in the various stages of syphilis.

3. A case of acute eczema presents itself for treatment; there is much moist exudation, with smarting and tingling and almost erysipelatous redness. It is proposed to give arsenic. Would this meet with your approval, and what would be your line of practice?

4. A patient comes to you in great alarm, thinking that he is paralysed, his legs feeling weak and heavy, and his gait becoming staggering. At the same time you observe a few pimples of acne on his forehead, and you learn that he has lately been suffering from sleeplessness. To what would your suspicions point as the cause of his symptoms?

5. Give directions for disinfecting a room which has been occupied by scarlatinous patients.

6. Mention a drug which seems to have a specific influence over the poison of erysipelas, and write a prescription, with full directions for its use.

7. Write a prescription for an effervescing draught containing carbonate of ammonia.

8. Point out the error in the following prescription :—

R. Tinct. hyoscyami	f 3ss. ;
Liq. potassæ	mxx. ;
Mucilaginis	f 3j. ;
Gentianæ infusi	f 3j.
Ter die.	

9. You are called to a very severe case of delirium tremens. It seems inadvisable to give opium, and chloral has already failed. What course, therefore, would you pursue ?

10. Mention the antidotes for prussic acid, strychnia, arsenic, and opium, with the general line of treatment to be pursued in a case of poisoning by each of these substances.

11. You are called to the following case. A middle-aged man has been known to suffer from heart-disease, and on applying your ear to his chest you hear a well-marked mitral-regurgitant bruit. His face is pale, with a tendency to lividity, his feet are beginning to swell, his pulse is weak and irregular, and does not accurately correspond to the beat of the heart, many of whose pulsations are not transmitted to the wrist. There are great anxiety and breathlessness, and ordinary stimulants have given only temporary relief. State your line of practice in such a case, and more especially the drug from which you would expect to derive speedy benefit.

12. Mention the various drugs which have been of service in tetanus, with your opinion of their relative efficiency, and give the dose of each.

13. Explain the action of the principal anæsthetic agents, and state which you consider to be most worthy of confidence.

14. Mention the remedies which act on the pupil, and divide them into those which act locally and constitutionally.

15. What is the advantage of the following prescription ?—

R. Tincturæ opii	m _x . ;
Acidi sulphurici diluti	m _{xx} . ;
Decocti hæmatoxyli	f _{3j} . M.
Ter die sumend.	

16. Write a soothing cough-medicine for a case of phthisis, and include chlorate of potash and morphia. Dose, one teaspoonful.

17. State the general treatment of a case of chorea, with the principal drugs which have been found useful, and give your opinion of their respective merits.

18. What are the indications by which we know that conium, arsenic, and strychnia are beginning to produce their physiological effects?

19. Mention those drugs which are most readily absorbed through the unbroken cuticle.

20. Enumerate the principal cholagogue cathartics.

21. State the principal differences between the action of opium and morphia.

22. You are called to see a case of severe sprained ankle, and hear that a friend is about to apply tincture of arnica. On inquiry you find that this remedy has never been used to this patient before. Would you sanction the treatment?

23. Enumerate those drugs which stimulate, and those which depress, the action of the heart.

24. State which drugs are most worthy of confidence in cases of neuralgia of the fifth nerve.

25. A patient presents himself with the following symptoms: Constipation and violent colicky pain in the belly, some loss of power in the extensor muscles of the arms, a bluish line along the margin of the gums, and anæmia. What is the cause of, and the proper treatment for, his complaint; and what prophylactic means would you recommend him to adopt?

26. Mention the various means of lowering the bodily temperature in health and disease, and explain their action, more especially enumerating those remedies which act only in conditions of pyrexia.

27. You have been attending a case of rheumatic fever, and all has gone on well until you are told one morning that the patient has had a disturbed night, has been restless and delirious, but that at the same time, the pain in the joints has subsided. You find him looking dull, confused, and

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OR,

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